The

Engineering Service – Always Available

WHEN YOU USE SWENSON LIME MUD FILTERS

It's good to know there's a Swenson Engineer *always* on hand to help you get the most out of your Swenson equipment. For example, when you use a Swenson Filter in your lime mud filtering operation your Swenson Engineer will show you how to obtain low soda losses and yet have a high percentage of solids in the cake discharge from the filter. He'll help you with any and all problems and there's no charge for his services. So ask for experienced Swenson Engineering Service in the *planning* stages and be assured of *continuous*, competent service for the entire lifetime of the equipment.

SWENSON EVAPORATOR CO.
15653 Lathrop Avenue, Harvey, Illinois

SWENSON

Proved Engineering for the Process Industries
SINCE 1889

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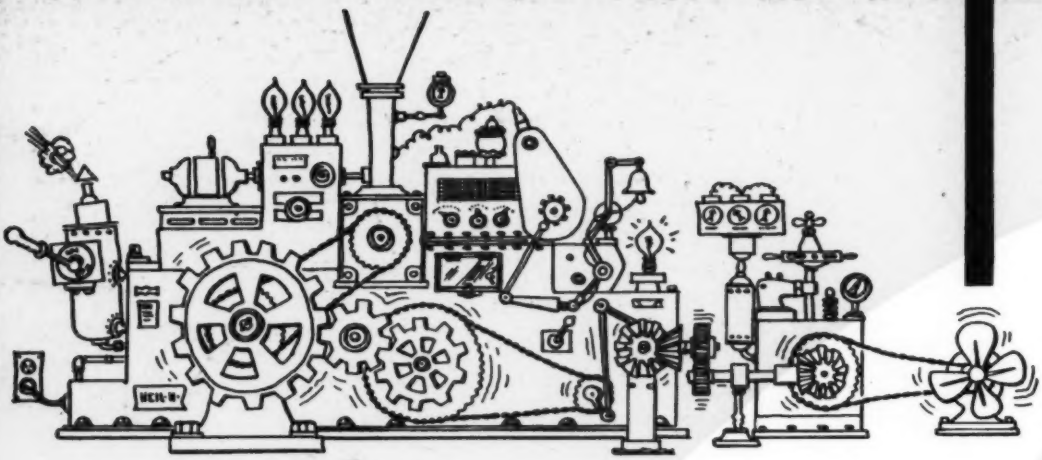
Pulp Washers • Evaporators
Filters • Digester Blow Condensers
Turpentine Condensers



the case of...

COMPLEXITY vs EFFICIENCY

The best way to insure highest efficiency for any mechanical work is to do it the simplest way with the fewest parts that will obtain the desired results.

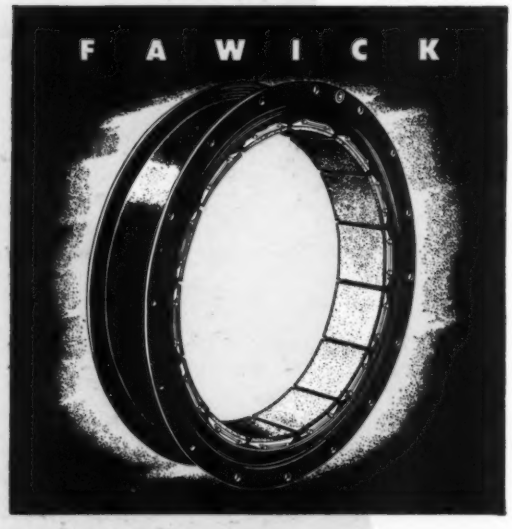
. . . and the best way to transmit mechanical power is by the simplest mechanism that will meet all operating requirements.

In the industrial field FAWICK Airflex CLUTCHES and BRAKES have proved this in their high operating efficiencies and outstanding performance on many different machines.

The simple space-saving design and rugged construction of FAWICK units not only contribute to superior machine operation but also provide overload protection to both men and equipment. In addition, FAWICK units reduce maintenance cost to an absolute minimum as they require no lubrication or adjustment for wear.

On your new machines, or in converting existing equipment to more efficient operation, you will find better performance with FAWICK AIRFLEX CLUTCHES and BRAKES.

Simple, compact, and performance-proved
FAWICK TYPE CB
Airflex CLUTCH.



SMOOTH SHOCK-FREE ACTION
MAXIMUM OVERLOAD PROTECTION
SPLIT-SECOND CONTROL
LONG MAINTENANCE-FREE LIFE

FAWICK AIRFLEX DIVISION
FEDERAL FAWICK CORPORATION
9919 CLINTON ROAD • CLEVELAND 11, OHIO

For further information on Fawick Industrial Clutch and Brake Units, write to the Main Office, Cleveland, Ohio for Bulletin 400-A.

FAWICK Airflex

INDUSTRIAL CLUTCHES AND BRAKES

TRUE BLUE

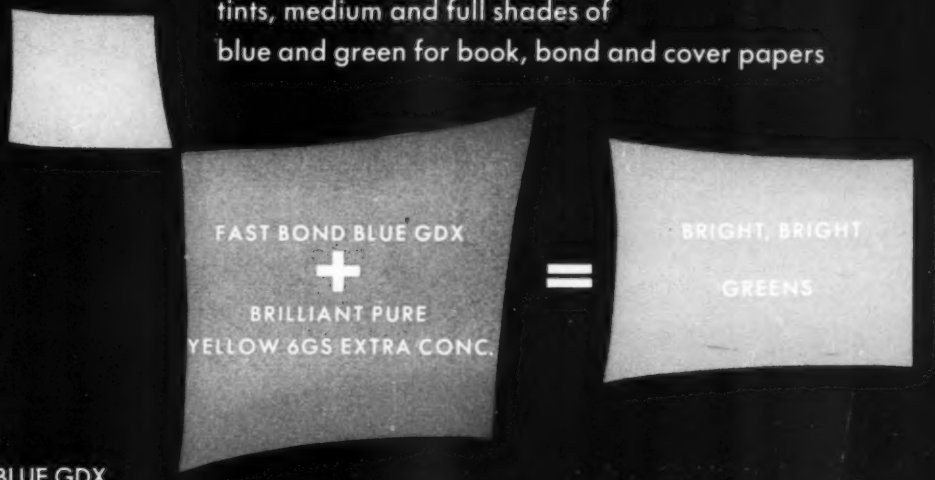
rapid development with good fastness to light

purest shade of blue available

fast bond blue GDX

- clear, bright shade
- minimum two-sidedness
- especially recommended for

tints, medium and full shades of
blue and green for book, bond and cover papers



When an acid blue is required,
you can count on FAST BOND BLUE GDX.
Samples and circular available on request.

From Research to Reality

gdc gaf

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A SALES DIVISION OF GENERAL ANILINE & FILM CORPORATION

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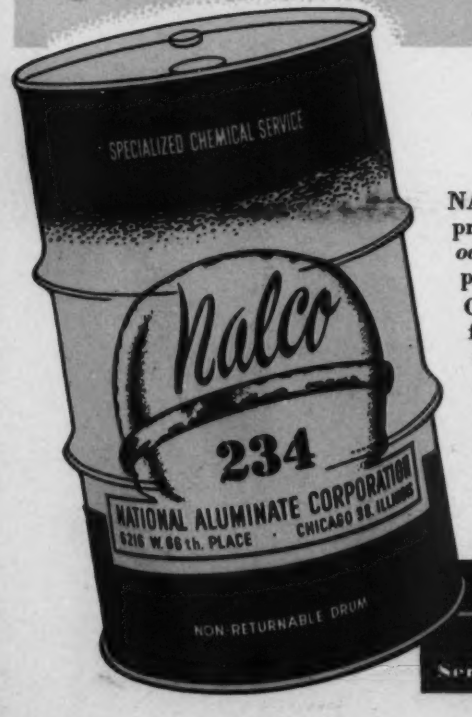
An Entirely New CHEMICAL

NON-MERCURIC • NON-PHENOLIC

Microbiologists in the Nalco Laboratories developed Nalco 234, a new concept in bactericides, in their continuing search for more efficient and versatile slime control methods.

Fast Action SLIME CONTROL



with *Nalco* 234

NALCO 234 is a new organic liquid formulation, developed and proved to meet an industry-wide need for a *quick-killing, non-odorous* bactericide for maintaining clean systems in all types of papermaking—including food packaging and sanitary papers.

Combining the advantages of excellent slime control with powerful dispersing action on fibrous and gelatinous masses in machine systems, Nalco 234 reduces breaks on machines, decreases total down time, and helps produce a more uniform sheet.

Write Nalco, or call your Nalco Representative for full data on fast-action Nalco 234.

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Serving the Paper Industry through Practical Applied Science

The Paper Industry

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VOLUME 36 • NUMBER 5 • AUGUST 1954

Published monthly by:
FRITZ PUBLICATIONS, INC.
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THE PAPER INDUSTRY—founded in 1919—known as "The Paper Industry and Paper World" from June, 1939, through December, 1949, assumed its original title with the January, 1950, issue.

Published at 1501 Washington Road, Mendota, Illinois.

Address all correspondence intended for publication to Editorial and Executive Office, 431 South Dearborn Street, Chicago 5, Illinois.

BPA

Member: Business Publications Audit of Circulation, Inc.

Entered as second class matter February 18, 1954, at the post office at Mendota, Illinois, under the Act of March 3, 1879.

Subscription rates: United States, U. S. Possessions, and Canada, $3.00 for one year, $5.00 for two years, $6.00 for three years. All other countries, $8.00 for one year, $18.00 for three years, payable in advance in U. S. Funds.

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The PAPER INDUSTRY is indexed regularly in **Engineering Index** and **Industrial Arts Index.** An index to each volume is issued annually by the publisher as a part of the April number.

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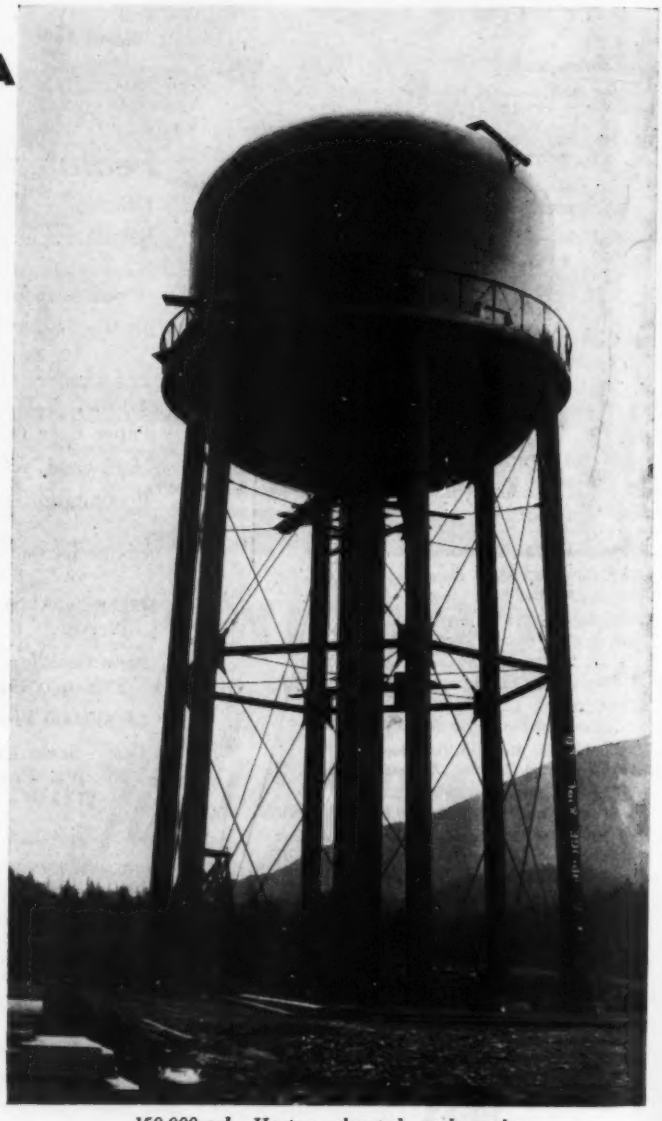
HORTON

ELEVATED TANK INSTALLED AT ALASKA PULP MILL

Shown at the right is a 150,000-gallon Horton® ellipsoidal-bottom elevated tank under construction for the Ketchikan Pulp and Paper Company at Ward Cove, Ketchikan, Alaska. Built in standard capacities from 15,000 to 500,000 gallons, Horton elevated tanks of this type provide a water supply that is ever available for general service needs, plant processing and fire protection. Other CB&I structures at the Ketchikan Pulp Plant include three spherical acid accumulators.

When a need develops at your mill for digesters, accumulators, chip tanks, blow tanks, an elevated water tank or any of the special steel plate work structures that are required for the efficient and profitable production of good pulp, turn your problems over to CB&I engineers. Write our nearest office for estimates or quotations on any structure that you need. There is no obligation on your part.



150,000-gal. Horton elevated tank under construction at the Ketchikan Pulp and Paper Co., Ward Cove, Ketchikan, Alaska.

CHICAGO BRIDGE & IRON COMPANY

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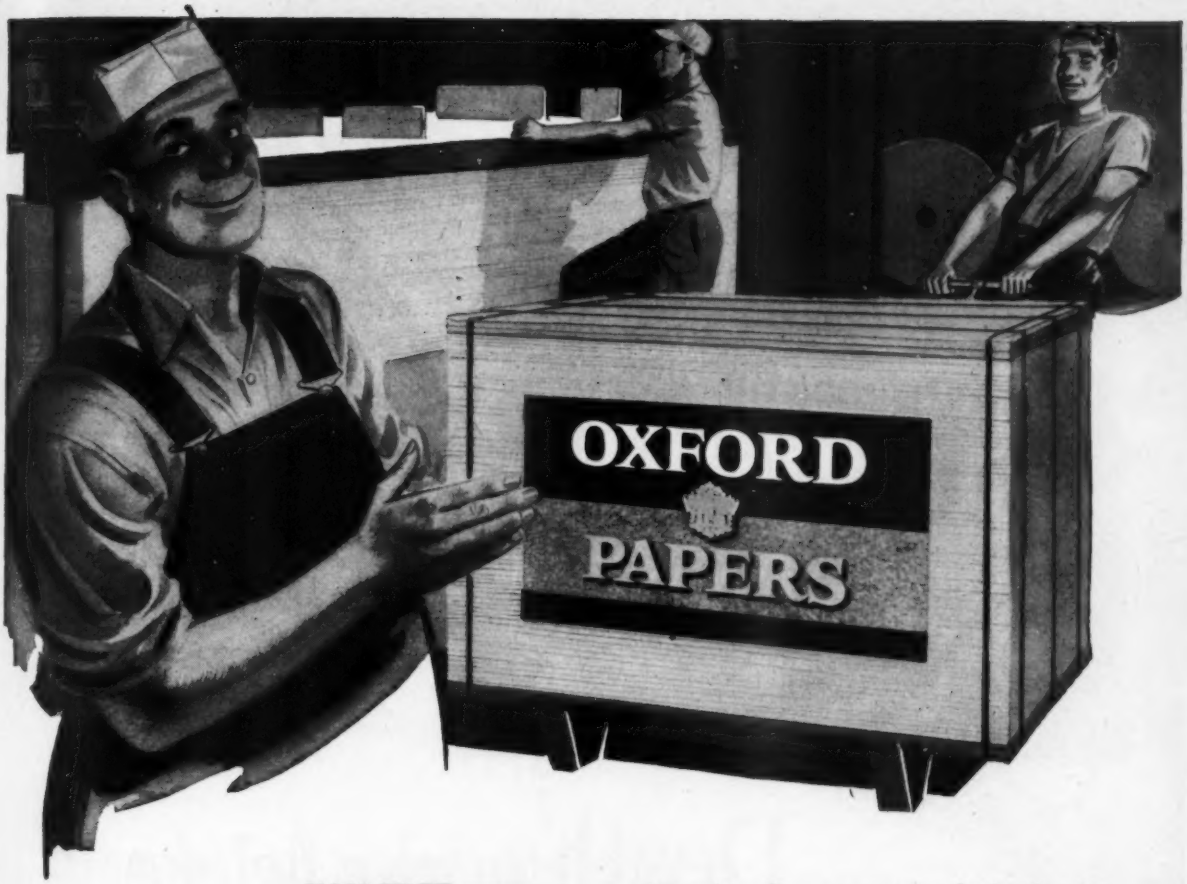
Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA.

In Canada: HORTON STEEL WORKS LIMITED, FORT ERIE, ONT.



HAM FELTZ says:

"It takes fine paper to do justice to fine typography and presswork.

"When printers see this trademark they know that it means fine paper.

"Yes, and it takes fine felts to make fine paper. Oxford is a consistent user of Hamilton Felts."

Hamilton Felts

MIAMI WOOLEN MILLS

Established 1858

From the thinnest tissue to the heaviest board there is a Hamilton Felt that will do your work better, faster and at lower cost.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

Death *takes a holiday...*

let's make it a PERMANENT VACATION!

Vital living forests in place of stagnant acres...control of deadly forest fires and their terrible consequences: Death must take a permanent vacation from America's forest lands.

Great progress has been made in protecting timber lands against fires since Weyerhaeuser initiated the Tree Farm movement in 1941 by establishing the Clemons Tree Farm. Weyerhaeuser rules call for vigorous protective measures not only against fires, but against forest insects and diseases as well.

At least 170 thousand forest fires nonetheless get started each year throughout the country; these avoidable fires lay horrible waste to about 15,000,000 forest acres annually.

Nine out of ten forest fires are preventable: they are man-caused and spring from public carelessness and ignorance. Thus, public education and Tree Farm organization will help prevent future forest fires.

Perpetual tree production plus the scientific control of fires assure woodpulp consumers of a constant supply from Weyerhaeuser.

WEYERHAEUSER

for more tons per day

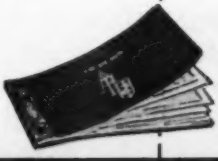
call in your

Albany Felt sales engineer

Albany sales engineers constantly strive to improve felt performance on your machines. They are trained in felt making, paper making, and especially in the proper application of individually designed, custom-made felts. They are backed up by the industry's leading service engineers and designers, outstanding chemical and mechanical laboratories, an extensive research and development program, and a product *famous* for uniformity. Ask your Albany Felt sales engineer to make a felt performance check with you on his next regular call. The goal: MORE TONS PER DAY.

William H. Schaffner

Serving paper mills throughout the states of New York and Connecticut for 14 years, he has been associated with the Albany Felt Company since 1926. Recently he was transferred to a territory in the Central South. Many Superintendents have benefited from Mr. Schaffner's discussions regarding felts and their application.



FREE! Felt Performance Record Book for Mill Superintendents, Managers, Purchasing Agents. Write for your handsome leather binder containing convenient forms for maintaining records and graphs of felt performance, felt inventory, etc.

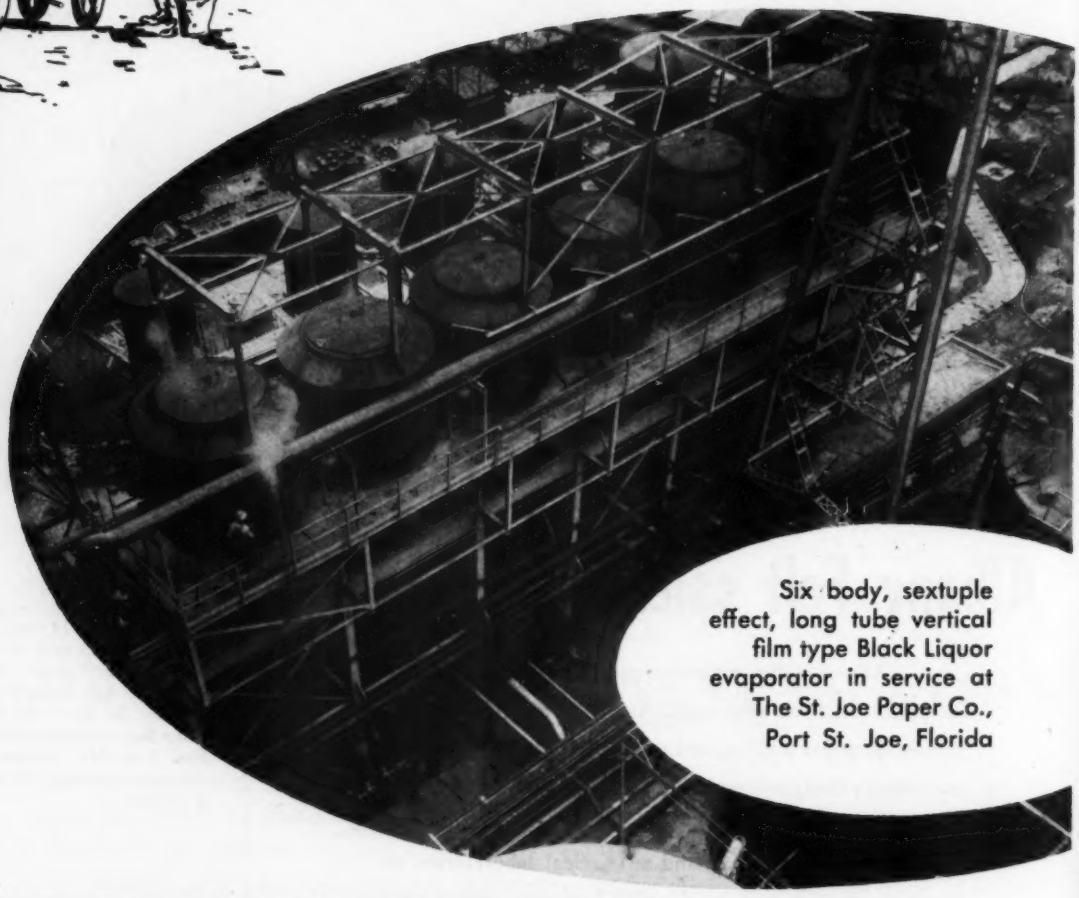
ALBANY FELT COMPANY

World's Largest Manufacturer of Paper Machine Felts

MAIN OFFICE AND PLANT, ALBANY 1, NEW YORK

Other plants: Hoosick Falls, N. Y., North Monmouth, Maine, Cowansville, Quebec

Longer Runs between "BOIL OUTS"!



Six body, sextuple effect, long tube vertical film type Black Liquor evaporator in service at The St. Joe Paper Co., Port St. Joe, Florida

G-B Engineering *know-how* makes the difference!

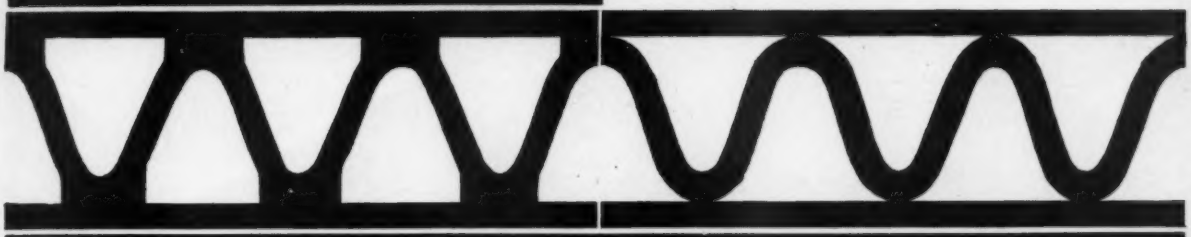
for, GOSLIN-BIRMINGHAM DESIGN ENGINEERS are also practical plant men with an understanding of plant and process problems. Thus, they are able to combine process knowledge with sound engineering practice to accomplish desired results in any given condition.

THERE IS NO SUBSTITUTE FOR EXPERIENCE!

GOSLIN-BIRMINGHAM MANUFACTURING CO., INC.

BIRMINGHAM • ALABAMA

GEL POINT control insures good adhesive



GOOD BOND

This graphic illustration shows how bond is improved if penetration is controlled with the inclusion of a fraction of a percent of Kelsize in the starch adhesive formula. Retention of water and water soluble chemicals in correct proportion with raw starch at the glue line is essential for proper gelatinization of the raw starch mixture.

POOR BOND

The above illustration shows how the moisture of the adhesive tends to migrate into the medium, leaving an unbalanced starch mixture at the glue line. Poor bond will result if the moisture of the starch paste soaks into the liners and medium before heat is applied and gel point reached.

Precisely engineered for specific uses, Kelco algin products are manufactured to absolutely uniform standards by the Kelco control procedure, which includes 46 distinct tests.

To insure best possible bond, call our nearest regional office for a free demonstration of Kelsize by one of our experienced paper technical men.

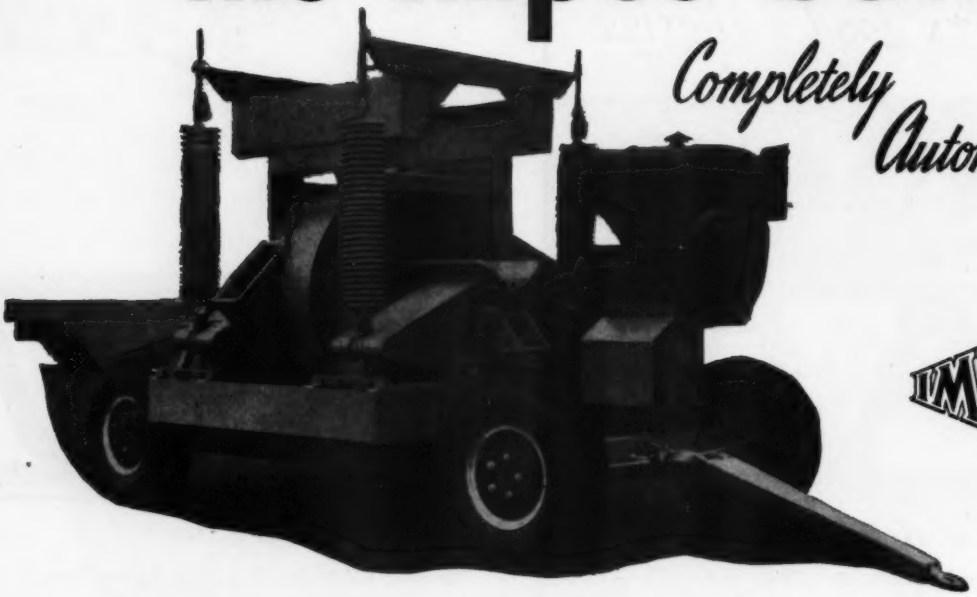
KELSIZE®... *a product of* **KELCO** *company*

31 Nassau Street, New York 5, N. Y.
20 N. Wacker Drive, Chicago 6, Ill.
530 W. Sixth Street, Los Angeles 14, Calif.
Cable Address: Kelcoalgin — New York

Introducing

the Impco barker

Completely Automatic



IMPCO

Easily handles irregular shaped logs!

The Impco Barker has been developed to meet today's high bark removal requirements combined with low wood loss.

It is available as a stationary unit for general wood yard barking or as a portable unit mounted on a heavy frame equipped with tires for highway towing. The mobile unit can be furnished with a self-propelling drive for moves between barking sites.

Capacities up to 20 cords per hour depending on conditions, size and type of wood can be expected.

Specifications:

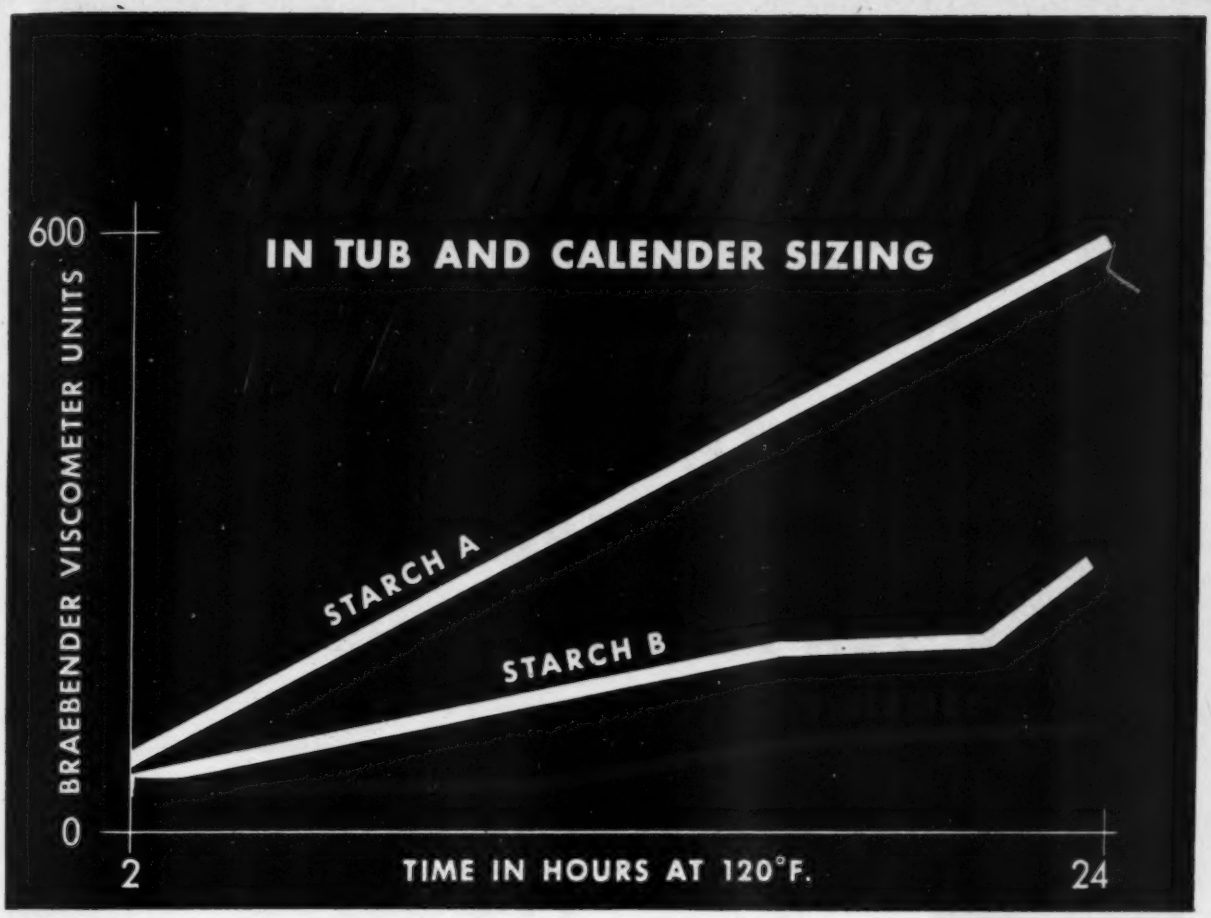
Wood size —
4' to 8' in length, 4" to 18" in diameter
Feed Rate —
30 to 120 f.p.m.
Infeed and outfeed Conveyors —
Automatic self-centering self-sizing
Barking Tools —
6 springloaded — automatic sizing for variable log diameters
Bark Discharge —
Mechanical ejection
Drives —
Gasoline or electric powered

IMPROVED MACHINERY INC.

NASHUA • NEW HAMPSHIRE

Sherbrooke Machineries Limited, Sherbrooke, Quebec, manufacture similar equipment in Canada

F 1-a



The graph tells the story of FIBERSIZE's performance—
its amazing stability as compared with competitive starches.

Now, about the product . . . it's an oxidized starch that gives you *controlled penetration* in tub and calender sizing.
It holds its viscosity over long periods of time. It won't become viscous and stick to rolls, causing paper to tear.

FIBERSIZE also has better strength characteristics than enzyme-converted starches. It has good clarity, permitting increased brightness and gloss of the sheet.

National Starch Products Inc., 270 Madison Ave., New York 16, N. Y.

I'D LIKE TO STOP INSTABILITY in tub and calender sizing.

Please send—

- ☐ Technical data on FIBERSIZE
- ☐ A sample of FIBERSIZE

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

National STARCH PRODUCTS

6 PLANTS NOW SETTING NEW STANDARDS FOR PULP BLEACHING...

...with **SOLVAY®** **Chlorine Dioxide Bleaching System**

- **New! Higher Brightness with No Loss in Strength**
- **New! Cleaner Product**
- **New! Greater Yield—Increased Production**
- **New! Control of Viscosity**

A NEW HIGH IN QUALITY—SOLVAY now makes it possible to achieve new standards of quality, dependability and color permanency. A color brightness from G.E. 88 to 94 is being obtained regularly with paper-making grades of kraft and sulphite pulp—*without loss of strength!* The pulp is cleaner with a virtual elimination of wood dirt and a corresponding reduction in shives. In addition, this process supplies the high quality and control of viscosity which are so important in the dissolving grades of paper.

SUCCESSFULLY PROVEN IN 6 OPERATING PLANTS
Over 2000 tons of pulp are now bleached daily. The total output is expected to exceed 2600 tons daily upon the completion of two additional plants this year.

CAN BE USED ON DIFFERENT GRADES OF PULP
At present, three grades of paper-making pulp—kraft, sulphite and neutral sulphite semi-chemical—are being bleached. In addition, dissolving grades of pulp (both prehydrolysis kraft and sulphite) for the production of synthetic fibres and cellophane are now in regular production.

FURTHER INFORMATION—If you would like additional data regarding the application of this process to a specific phase in your operations write us in confidence, giving full details. SOLVAY's Technical Service is available at no cost during design stages, start-up and training periods.

The SOLVAY chlorine dioxide bleaching process is operated in a specially developed bleach cell unit designed by Improved Machinery Corporation.

Both the chlorine dioxide manufacturing unit and the flow bleaching process are available on a non-exclusive contract and on a royalty-free basis.

SOLVAY PROCESS DIVISION
Allied Chemical & Dye Corporation
61 Broadway, New York 6, N. Y.

Allied Chemical

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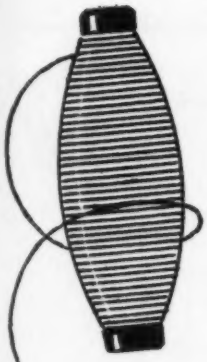
A NEW DEVELOPMENT IN FELT MAKING

another "TENAX PLUS"



A long-standing Lockport Felt Company policy directs that whenever possible **every** component of **every** TENAX FELT be produced in the Lockport plant. From sorting the raw wool to the completion of the finished felt, wool felts are ALL-LOCKPORT . . . QUALITY-CONTROLLED in every step of their manufacture.

Now, this rigid control of quality is applied to the production of **worsted yarn.** More than two years of research and planning . . . by Lockport technical experts collaborating with the Research Division of the Whitin Machine Works . . . resulted in the development of the Worsted Spinning Frame shown above. This new Spinning Frame, together with other machines shown for the **first time** at the Textile Machinery Show in Atlantic City on April 26th, had been in operation at Lockport since early 1954. This is the first application to the production of paper-makers felts.

Let your Lockport Felt Company representative show you why TENAX FELTS . . . made by the **only** felt-manufacturer with facilities to produce **both** woolen and worsted yarns . . . can serve you better.

LOCKPORT FELT CO.

NEWFANE, NEW YORK

TENAX FELTS

Edgar

SPRAY-SATIN

a new coating clay . . .

FINE FRACTION · SPRAY DRIED · HIGH QUALITY

a finer product for you

HIGHEST SHEET STANDARDS . . . demanded today by an increasing number of mills producing for quality conscious customers . . . were the reasons for the development of **SPRAY-SATIN** . . . an entirely new, but production proved, fine fraction coating clay.

Spray Drying - another Edgar First

For many years it has been known that the purest and most uniform clays could be produced by the "Spray Drying Method" . . . this is the same process used to make your morning's instant coffee. Many years of experimentation, development and commercial production by Edgar technicians have made "Spray Drying" a commercial success. The result is a new $750,000.00 plant expansion to provide you with the finest coating clay modern technology can produce.

try SPRAY-SATIN *in your own plant*

with these solid

cost saving advantages

BONE DRY— Only with Spray Drying can you have a guarantee of less than 1% moisture without ever having the clay over-dried. In SPRAY-SATIN you will never find a pinhead . . . never a particle of calcined clay.

HIGHEST PURITY—In addition to finer than usual mechanical screenings, the spray drying process makes possible a magnetic screening of the slip to produce a purity of product never before achieved.

FREE FLOWING — EDGAR SPRAY-SATIN flows like sand. There is no caking, no arching in silos. Works wonderfully in airveyors and gravity flow systems. You will experience real cost savings in the handling of SPRAY-SATIN.

HIGH UNIFORMITY— Day in and day out and year in and year out, the spray drying process produces a product of unmatched uniformity. The precise controls of the spray drying method makes this high uniformity possible.

HIGH BULK DENSITY — Another unique advantage of the "Spray Drying Method" is a product of unusually high bulk density. For buyers who have storage problems, or who enjoy "incentive loading" freight rates, or who use covered hopper cars, there are substantial savings in the use of SPRAY-SATIN.

EASY MAKE-DOWN—Before the slip enters the final spray drying process a dispersant is added. You will find that SPRAY-SATIN will go into suspension almost immediately . . . make-down time is dramatically reduced.

Edgar Division

METUCHEN, NEW JERSEY

MINERALS & CHEMICALS CORPORATION OF AMERICA

Try a sample run of SPRAY-SATIN in your own plant . . . the product will prove itself.

EDGAR DIVISION, 8 STATION PLACE, METUCHEN, NEW JERSEY
MINERALS & CHEMICALS CORPORATION OF AMERICA

Please send me, without obligation, sample as checked ⬡ 2 lb. ⬡ 5 lb. ⬡ 10 lb.

Name _____

Company _____

Address _____

City _____ Zone _____ State _____

For *Long Service* Life

...B&W Carbon Steel Pressure Tubing

The collection of qualities found in B&W Carbon Steel Pressure Tubing, Seamless or Welded, adds up to the all-important end result of long service life.

No less important are the "pre-operating" qualities like uniform ductility, accuracy of dimension and ease of fabrication and installation. Each is a plus that contributes to overall *working* satisfaction from beginning to end use.

Specifically, B&W Carbon Steel Seamless Tubing is available in sizes up to 9⅝ inches outside diameter and B&W Welded is available in sizes up to 4 inches outside diameter. Both in a wide range of wall thicknesses.

As for finishes, seamless is produced either hot-finished or cold-drawn and welded is produced from either hot- or cold-rolled strip.

It meets the applicable specifications of the ASTM, ASME and Government as well as many specifications that may be required for an extraordinary end use.

Where and whenever Seamless or Welded Carbon Pressure Tubing is indicated, make use of B&W's many years in the manufacture of all kinds of tubing. Make *use* of B&W Carbon Steel Pressure Tubing.

B&W SEAMLESS and WELDED TUBES

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

For the complete Carbon Steel Pressure story, write for B&W Bulletin TDC-142.

TA-4062(CP)

GATE VALVE *(upper left)* **Fig. 2194** for 225 pounds W.O.G. Screwed ends, bolted flanged bonnet, inside screw rising stem. Body and bonnet are made of Ni-Resist, with 18-8S Mo Stainless Steel (Type 316) stem, seats, and wedge. Sizes ¼" to 2", inclusive.

GATE VALVE *(upper right)* **Fig. 2195** for 200 pounds W.O.G. Flanged ends, bolted flanged bonnet, inside screw rising stem. Ni-Resist body and bonnet, with stem, seats, and wedge made of 18-8S Mo (Type 316) Stainless Steel. Sizes 1" to 3", inclusive.

GATE VALVE *(lower left)* **Fig. 2193** for 200 pounds W.O.G. Flanged ends, bolted flanged bonnet, outside screw rising stem and one-piece yoke. Body, bonnet, and yoke are Ni-Resist. Stem, seats, and wedge are 18-8S Mo (Type 316) Stainless Steel. Size 4".

LARGE SIZE GATE VALVE *(lower right)* **Fig. 2193,** 5" to 12", inclusive, for 200 pounds W.O.G. Flanged ends, bolted flanged bonnet, outside screw rising stem and two-piece yoke. Ni-Resist body, bonnet, and yoke, with 18-8S Mo (Type 316) Stainless Steel stem, seats and wedge faces.

It's a winning move every time you select Powell *Ni-Resist* Valves. For here is an alloy that has far greater corrosion and heat resistance than ordinary Cast Iron. Similar to gray iron, and resembling austenitic stainless steel in many ways, no other cast metal offers such a unique combination of useful properties.

Powell Ni-Resist Valves are especially adapted for handling pulp and paper mill liquors, oil refinery acids, alkalies and sludges, caustic soda, pickling solutions, sea water and many other fluids. Shown here are just a few of them to help you checkmate the high cost of corrosion. They're available through distributors in principal cities. If a distributor is not located near you, just write us—The William Powell Company, Cincinnati 22, Ohio. We'll be pleased to tell you more about these valves—or to help you with your valve problems. Powell has probably solved more valve problems than any other organization in the world.

CONTROLS FOR THE LIFE LINES OF INDUSTRY

.....108th YEAR

THE PROOF OF SIZE

MILLS KNOW PEXOL GIVES MORE FOR THEIR DOLLAR THAN ANY OTHER FORTIFIED SIZE

There are many good reasons why Pexol outsells any other fortified size on the market. Not the least of these is Hercules' unequaled service facilities, which provide every Pexol user with the advantages of a product tailored to his needs. Hercules' technical representatives, trained for service to the paper making industry *exclusively*, are available to visit your plant, study your operating conditions, and recommend a Pexol formulation that will give optimum solubility, low foam index, and overall sizing efficiency. Such service is a Hercules "plus"—insures the most for your sizing dollar *in actual use!*

FACTS ABOUT FOAM

There has been much comment about foam caused by rosin size. The simple fact is: **NO OTHER FORTIFIED SIZE HAS A LOWER FOAM INDEX THAN HERCULES PEXOL**, and at an equal degree of fortification no other size can even approach it.

RESEARCH FACILITIES

The finest research facilities possible, devoted exclusively to paper making chemicals and their application, are available in helping you improve your product or processing methods. Trained technicians in the laboratory back up Hercules' technical representatives in the field—put at your disposal over forty years of experience in solving paper making problems.

VARIETY

No one size, dry or paste, can possibly fit every requirement. That's why Pexol is available in both paste and dry forms, and in numerous types. Or, if your needs are unusual, Hercules will develop special modifications of existing formulations to meet specific conditions.

ECONOMY

Pexol brings reductions in size furnish . . . often as high as 30 to 50%. That means lower inventories, reduced freight and handling cost. Yet sizing tests are maintained . . . often improved. In every way, Pexol is a balanced fortified size that gives the most of all desirable properties—the most for your sizing dollar!

RESULTS

The final test of any size is how well it works for *you*. Pexol outsells all other fortified sizes. To maintain such a record, it *must* give results! If you're among the few who haven't yet tried Pexol, contact your Hercules technical representative. He'll be glad to demonstrate what you've been missing.

Paper Makers Chemical Department

HERCULES POWDER COMPANY
INCORPORATED

961 King St., Wilmington 99, Delaware

FOR OPTIMUM SOLUBILITY, LOW FOAM INDEX, AND SIZING EFFICIENCY . . .

ZE IS IN ITS USE...

AR

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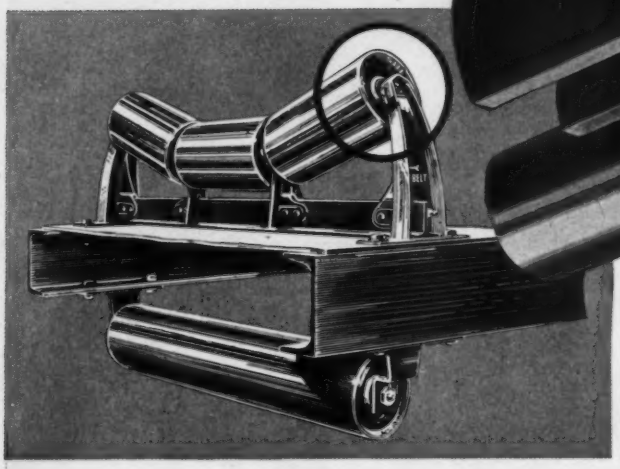
HERCULES

PEXOL®

FORTIFIED SIZE

LONGER IDLER LIFE STARTS *HERE*

Positive grease seal of LINK-BELT IDLERS is the most effective on the market



NO BELT CONVEYOR IDLER is any better than its bearings. And no bearing outlasts its grease seals. That's why the seals on Link-Belt roller bearing idlers are so important to you.

The result of many years of intensive laboratory and field testing—the positive Link-Belt seal excludes dirt and moisture —retains lubricant. A contact seal of felt and neoprene combined with labyrinth is constructed into a cartridge unit. There are no springs, no loose washers, no possibility of metal-to-metal contact.

And this is just one of the many engineering extras that make Link-Belt Idlers last longer. Check the box at right. Then ask your nearby Link-Belt office or distributor for a copy of new 48-page Book 2416. See for yourself how industry's most comprehensive line of idlers can mean lower handling costs for you.

6 other reasons why LINK-BELT IDLERS cut handling costs

1. **HUSKY, HIGHEST QUALITY BEARINGS,** free and easy turning, assure maximum life, minimum belt-wear, low power consumption.
2. **SAFE, CONVENIENT GREASE FITTINGS** provide ease of lubrication—lubrication for longer life.
3. **CONCENTRIC ROLLS** have smooth surfaces and rounded edges. Machine-made, continuous welds prevent entrance of dirt and moisture.
4. **OUTER SHELL COUNTERBORES AND COUNTERBORES AND JOURNAL** of the heavy 3/16" thick wall bearing retainer tubes with the press fits of the roll head assures hop-free rotation.
5. **STRONG, RIGID FRAMES** support rolls in perfect alignment. Rolls are securely held in place but can be easily removed for inspection and service.
6. **GROOVED HEX NUTS** lock into malleable brackets, creating truss effect—prevent shaft rotation and bracket spreading under both vertical and impact loads.

LINK-BELT

BELT CONVEYOR IDLERS

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 13,522

For corrosion resistance at low cost

STOCKHAM
NICKEL IRON GATE VALVES

give you this:

Less outlay than steel valves for pulp and paper mill service. Strong, wear resistant bodies of nickel alloy cast iron. Stainless steel trim on all parts exposed to corrosive liquids. Swing type gland flange bolts. Extra deep stuffing boxes with adequate packing. These are some of the reasons why the name Stockham on your valves means long, cost-saving service on your lines. Write for detailed information.

VALVES:
Bronze • Iron Body • Steel
Wedgeplug Dry Plug

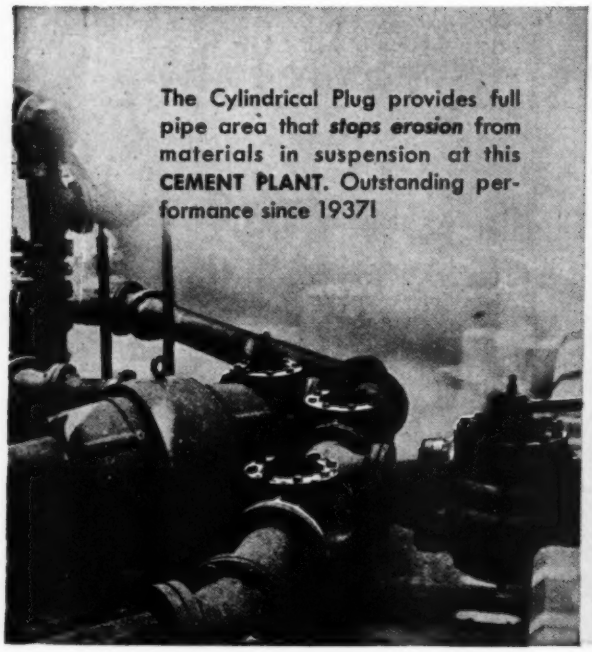
FITTINGS:
Cast Iron Screwed, Flanged
Cast Iron Drainage
Malleable Fittings
Malleable Unions

STOCKHAM VALVES & FITTINGS

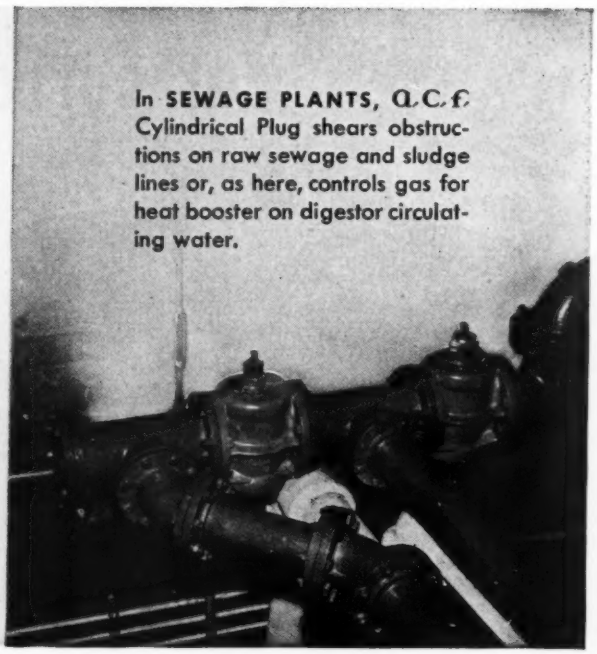
GENERAL OFFICES AND PLANT • BIRMINGHAM 2, ALABAMA

Warehouse Stocks and Sales Services Strategically Located

DISTRIBUTED THROUGH WHOLESALERS



The Cylindrical Plug provides full pipe area that ***stops erosion*** from materials in suspension at this **CEMENT PLANT.** Outstanding performance since 1937!



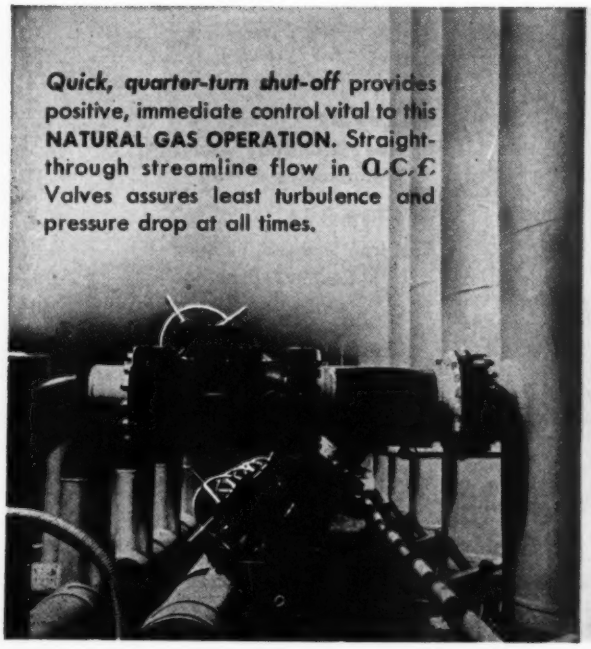
In **SEWAGE PLANTS,** acf Cylindrical Plug shears obstructions on raw sewage and sludge lines or, as here, controls gas for heat booster on digestor circulating water.

PROOF OF SUPERIORITY

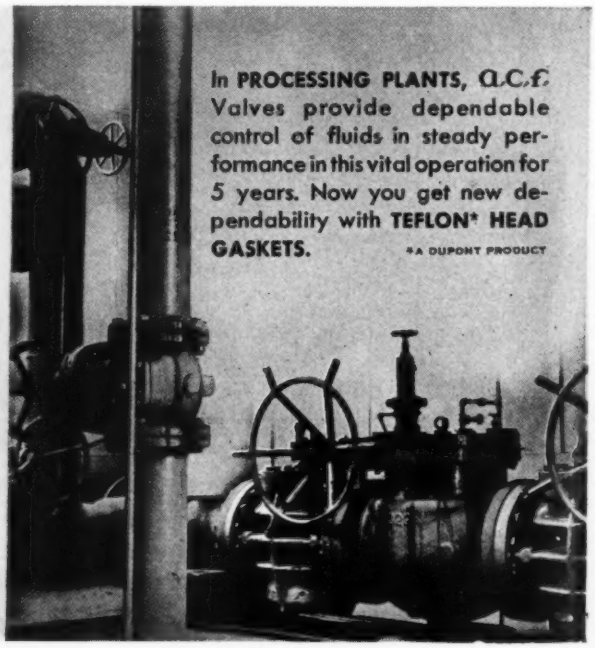
acf CYLINDRICAL FULL PIPE AREA PLUG VALVES

Representatives in
50 Principal Cities

Write for descriptive Catalog 4-PI to ACF Industries, Inc., Valve Div., 1501 E. Ferry Ave., Detroit 11, Mich.



Quick, quarter-turn shut-off provides positive, immediate control vital to this **NATURAL GAS OPERATION.** Straight-through streamline flow in acf Valves assures least turbulence and pressure drop at all times.



In **PROCESSING PLANTS,** acf Valves provide dependable control of fluids in steady performance in this vital operation for 5 years. Now you get new dependability with **TEFLON* HEAD GASKETS.**

*A DUPONT PRODUCT

954

MORE PULP
PURER PULP
...LOWER COSTS PER TON

with

AMMONIUM *Bisulfite Pulping*

• **More pulp**—a higher proportion of acceptable pulp of increased freeness is produced, thus increasing the capacity of knotters, deckers, washers and fine screen equipment.

And here are some additional reasons why leading mills have converted to the high-production, low-cost Ammonium Bisulfite Pulping process using Barrett® Brand Anhydrous Ammonia:

• **Better quality**—unbleached pulp is more uniform, stronger, brighter; has lower ash and lower screened speck count. Less bleach needed.

• **Saves steam**—superior penetration reduces cooking time and maximum temperatures. Temperatures are lowered as much as 30°F!

• **Saves labor**—one ton of ammonia replaces *three* tons of limestone. Handling of limestone, scaling is eliminated.

• **Overcomes steam pollution**—waste liquor is *easily evaporated;* there is a greater recovery of heat and chemicals; while steam pollution is reduced to a minimum.

The changeover to this Pulping Process—pioneered by us—is inexpensive. A minimum replacement—and in many cases no replacement—of equipment is involved, and there is practically no loss of production during conversion.

Why not wire, phone or write us today? A member of our Technical Service staff will call, give you full details, facts and conversion methods. No obligation!

NITROGEN DIVISION ALLIED CHEMICAL

Anhydrous Ammonia

NITROGEN DIVISION

ALLIED CHEMICAL & DYE CORPORATION
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Ammonia • Sodium Nitrate • Urea • Ethylene Oxide
Ethylene Glycol • Diethylene Glycol • Triethylene Glycol • Methanol • Formaldehyde • Nitrogen Tetroxide • U.F. Concentrate–85 • Nitrogen Solutions • Fertilizers & Feed Supplements

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☐ Yes, please send me full details on your Ammonium Bisulfite Pulping Process.

☐ Please arrange to have your Technical Service Man call! No obligation.

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Company_____

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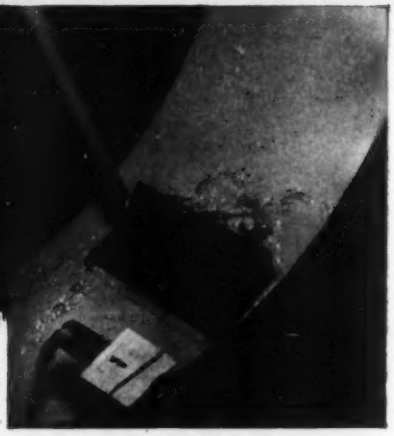
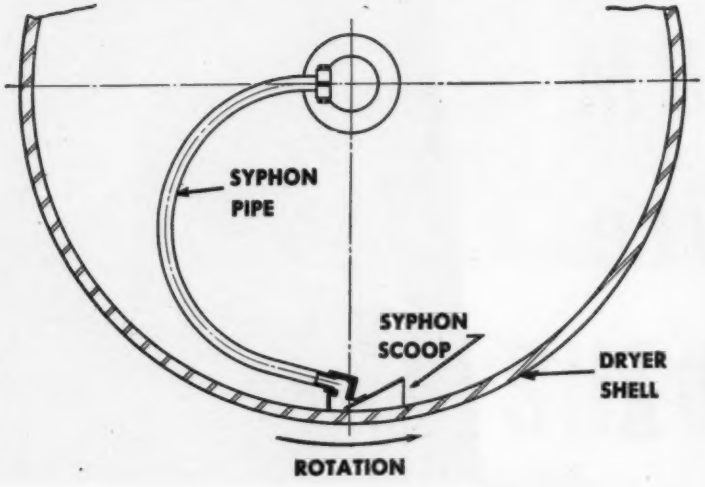
New Syphon Scoop Drains Dryers at any Speed





SLOW SPEED—210 fpm. Photo of test drum shows that water is almost completely scooped from the bottom of the drum by each revolution of the Armstrong Syphon Scoop.

FASTER—810 fpm. Water carried well up the inside surface of the drum. Still there is no water accumulation because of the scooping action.

Reduces Power Required; Increases Heat Transfer

The new Armstrong Syphon Scoop operates efficiently at any speed. The opening of the Syphon Scoop, which is only 1/16" away from the shell, removes all condensate at low speeds. At rimming speeds, there can be only 1/16" film.

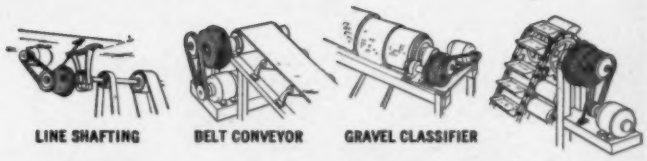
With Armstrong Syphon Scoops your dryers will not carry heavy loads of condensate that require excessive driving power. And there is a bonus of higher surface temperatures that will give you profitable extra capacity.

1200 FPM—water "rimming". Still almost no water in the drum. The Syphon Scoop now acts purely as a revolving syphon, but, unlike ordinary syphons, it removes the water down to within 1/16" of inner surface of drum.

SEND FOR TEST REPORT NO. 1 — how Syphon Scoop drained 110 gallons of condensate from kraft paper face dryer in 3½ hours compared to 25 gallons for stationary syphon. Free on request without obligation.

ARMSTRONG MACHINE WORKS
816 Hoffman Street • Three Rivers, Michigan
STEAM TRAPS . . . PAPER MACHINE MOISTURE CONTROL . . . INDIVIDUAL DRYER TEMPERATURE CONTROL . . . STEAM HUMIDIFIERS

Falk ALL-STEEL Shaft Mounted Drives

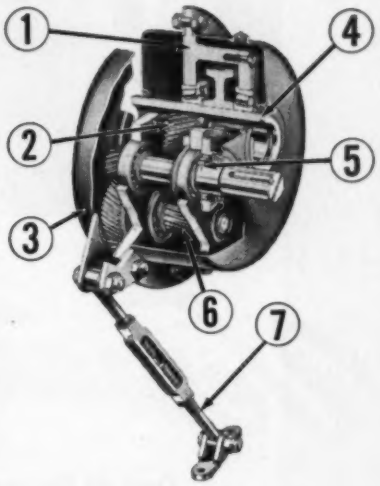


APPLICATIONS UNLIMITED

The range of applications to which the all-steel Falk Shaft Mounted Drive is ideally suited is so wide that complete listing is impracticable. The sketches above are included only to indicate a few typical installations where considerable speed reduction in limited space is an important advantage.

SIX SIZES

- 1/2 to 30 hp
- Single or double reduction
- Wide output speed range—420 to 10 rpm



These versatile, NEW speed-reducing units

save space, power, material and time

Here is the economical solution to the countless application problems requiring efficient speed reduction in limited space! The new Falk all-steel Shaft Mounted Drive—a modification of the universally-accepted Falk Motoreducer design—embodies many exclusive structural and functional features which add up to better service, longer life and substantial savings.

This rugged, compact drive mounts directly on the driven shaft—a distinct saving in floor space. Its precision Falk helical gearing gives highest mechanical efficiency, with a resultant power saving. No adjustable motor bases or slide rails are required. Installation is simple and rapid—output speeds can be quickly changed; thus time is saved...Write to Department 247 for engineering bulletin, including selection and dimension details.

FALK "In-Built" Factors... that give maximum efficiency, convenience and dependability

1 **All-steel Frame,** with more than double the rigidity of iron, supports all rotating elements.

2 **Precision Helical Gears,** designed and machined by Falk, rated to AGMA standards.

3 **Pressed Steel Housings,** whose sole function is to keep oil in, dirt out; easily removed for gear inspection without dismounting unit.

4 **Through Hollow Shaft** with counter bore provides for easiest installation or removal from driven machine shaft extensions.

5 **Backstop** can be furnished with the unit or added later for positive prevention of reverse rotation.

6 **Positive Lubrication,** continuous direct dip of revolving elements at all speeds.

7 **Tie Rod** and turnbuckle serve as anchor and facilitate V-belt or chain adjustment.

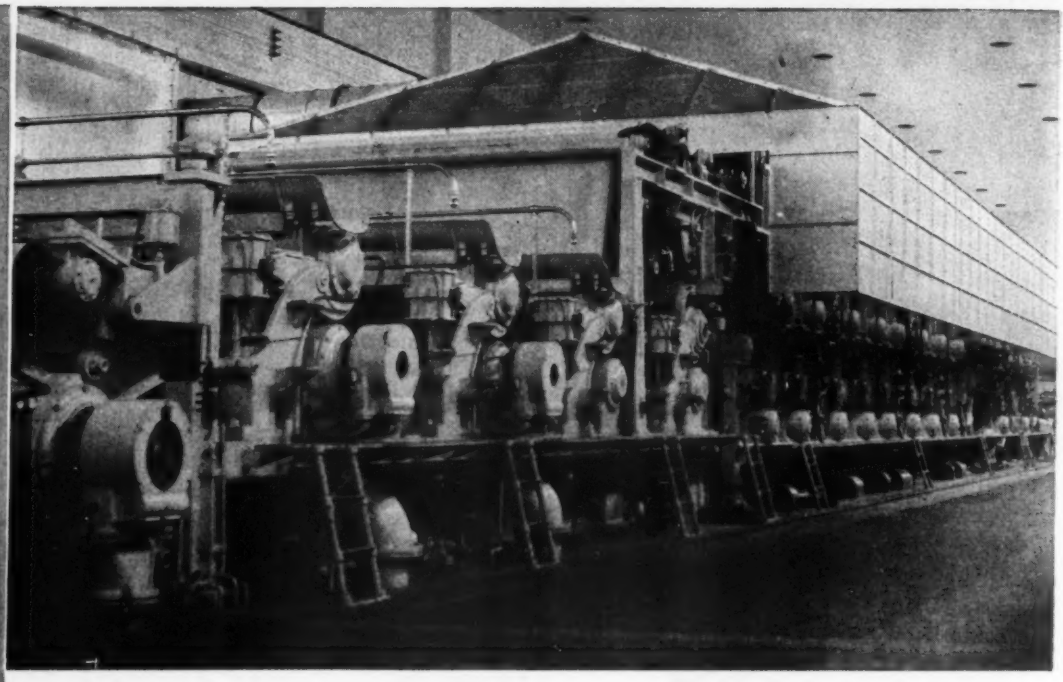
THE FALK CORPORATION, Milwaukee 8, Wisconsin

MANUFACTURERS OF

- Motoreducers
- Speed Reducers
- Flexible Couplings
- Shaft Mounted Drives
- High Speed Drives
- Special Gear Drives
- Single Helical Gears
- Herringbone Gears
- Marine Drives
- Steel Castings
- Weldments
- Contract Machining

FALK

...a good name in industry



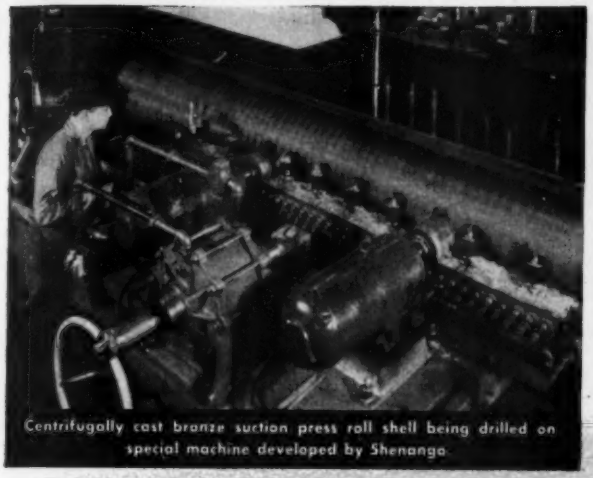
Versatility...

One of the most versatile fourdrinier paper machines ever built, it has produced grades from light weight crepe tissue to heavy multi-wall bag paper. Bagley & Sewall's over a century of experience in designing and building pulp and paper making machinery benefits two ways — experience and ingenuity to design and build to most exacting needs of the mill with successful and productively economic results for management. We invite your consultation with our engineering staff on your pulp and paper making machinery problems or plans — let Bagley & Sewall know-how and versatile engineering serve you.

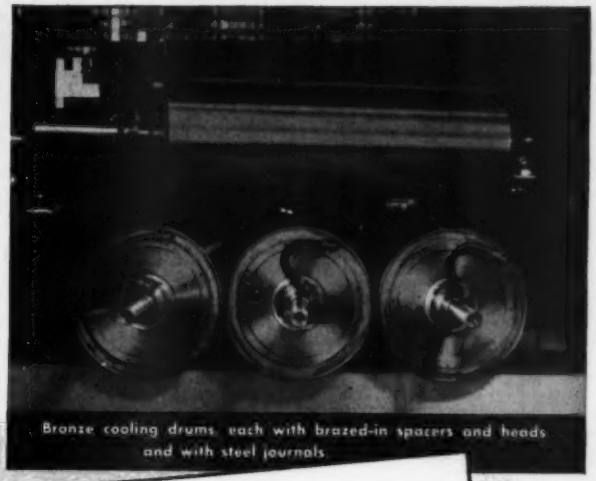
designers and builders of paper making machinery
Since 1853

BAGLEY & SEWALL
WATERTOWN • NEW YORK

Foreign Representative: **CASTLE AND OVERTON, INC., 630 Fifth Avenue, New York 20, New York**
West Coast Representative: **DAN CHARLES AGENCY, 1331 Third Avenue, Seattle 1, Washington**
Finland Representative: **AKTIEBOLAGET EKSTROMS MASKINAFFAR, Helsingfors, Finland**



Centrifugally cast bronze suction press roll shell being drilled on special machine developed by Shenango



Bronze cooling drums, each with brazed-in spacers and heads and with steel journals

Shenango Qualities mean longer roll life

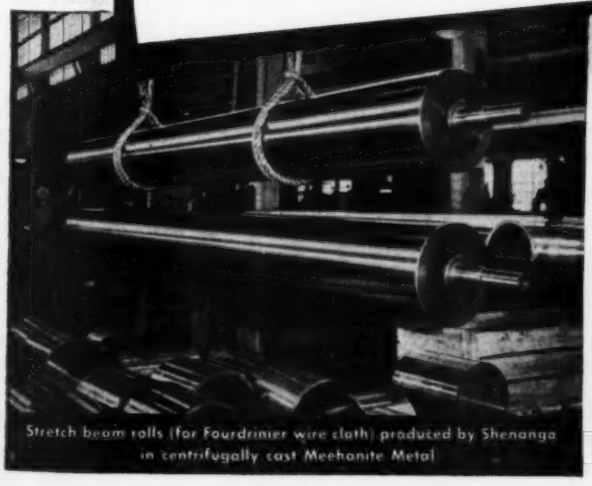
SHENANGO-made rolls, simple or complex, large or small, have one important thing in common. They are cast by the Shenango highly advanced centrifugal process. This means stronger, pressure-dense metal with finer grain... better able to withstand friction as well as pressure and heat stresses.

This, together with Shenango's modern machining and finishing facilities, adds up to superior, money-saving performance for rolls, roll cores, drums and assemblies made precisely to your specifications.

It will pay you to specify Shenango. For further information or data on meeting your specific needs, write to: Shenango-Penn Mold Company, Centrifugal Castings Division, Dover, Ohio (Executive Offices: Pittsburgh, Pa.).

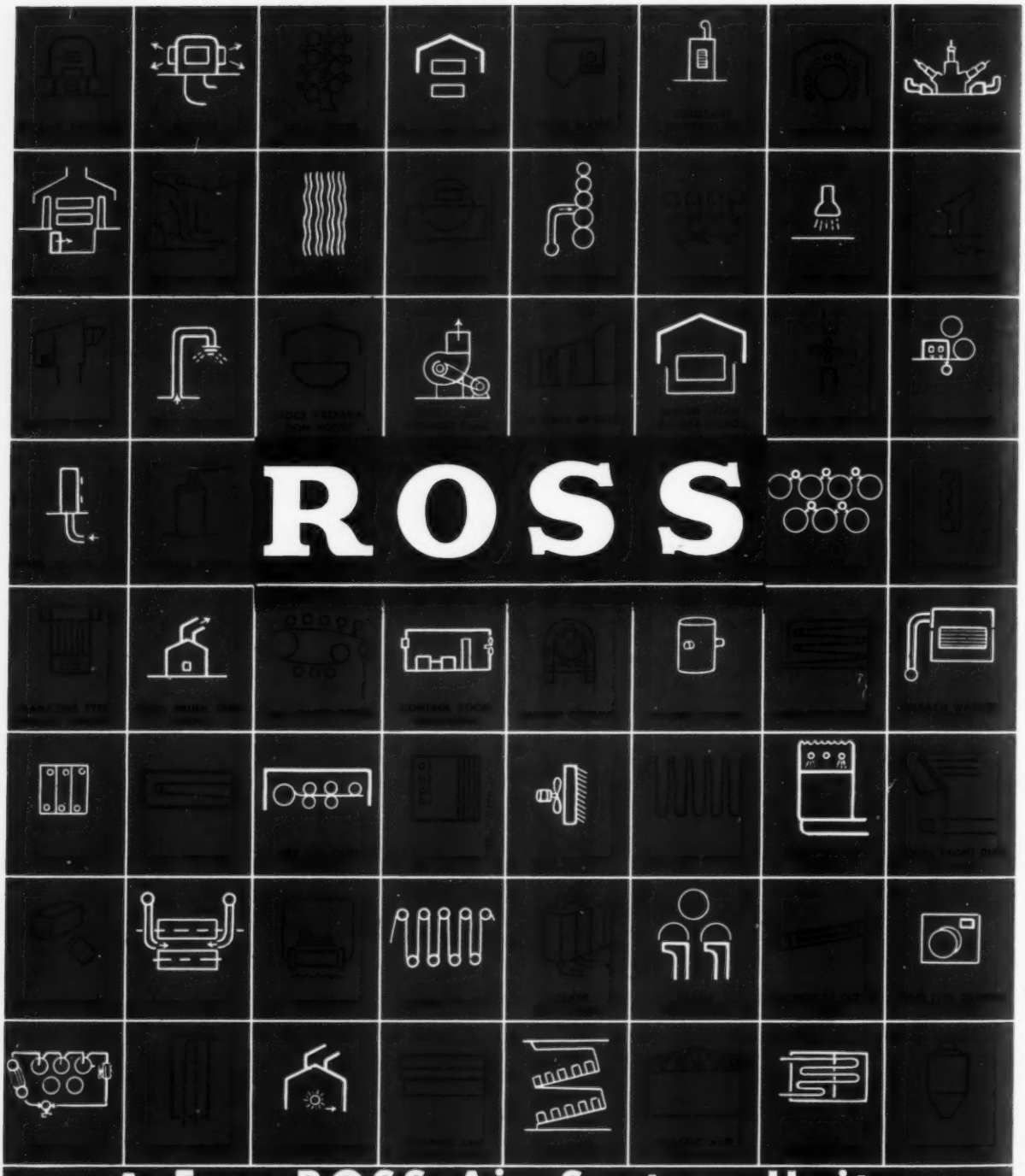
SHENANGO

ALL RED BRONZES • MANGANESE BRONZES • ALUMINUM BRONZES
MONEL METAL • NI-RESIST • MEEHANITE® METAL



Stretch beam rolls (for Fourdrinier wire cloth) produced by Shenango in centrifugally cast Meehanite Metal

Bronze breast roll with steel inserts, centrifugally cast, finished and assembled in the modern Shenango shops



A Few ROSS Air System Units

ROSS SYSTEMS

J. O. ROSS ENGINEERING

CORPORATION

MANUFACTURERS OF AIR PROCESSING SYSTEMS

444 MADISON AVENUE **NEW YORK 22, N. Y.**

ATLANTA • BOSTON • DETROIT • CHICAGO • SEATTLE • LOS ANGELES

ROSS ENGINEERING OF CANADA, LIMITED, MONTREAL, CANADA • CARRIER-ROSS ENGINEERING COMPANY, LIMITED, LONDON, ENGLAND

The Paper Industry

August 1954

Can we retain a competitive advantage?

The competitive advantage enjoyed by the industry of the U. S. A. on the world market has been due in the past largely to our superiority in production know-how — for we excel in the art of plant design, streamlining of operations, and integration of manufacturing operations. Our industry has been able to maintain this advantage despite high labor costs, which may be three times as high as those of some of our European competitors.

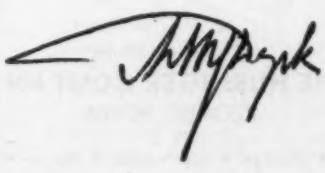
There are signs that other nations are making rapid progress in increasing their industrial productivity and are rapidly catching up with what hitherto has been accepted as an exclusively American *forte*. Continuous pulping methods are being adopted in many European countries and, it is believed, by 1956 the entire Swedish pulping industry will have been converted to chlorine dioxide bleaching — thus enabling it to produce significantly superior pulps. Compare this with only eleven chlorine dioxide bleaching facilities now in operation on the North American continent and eleven additional chlorine dioxide installations which are expected to be completed before the end of 1955, as reported by Dr. W. H. Rapson at the recent meeting of the A.P.P.S.A. in Montreal.

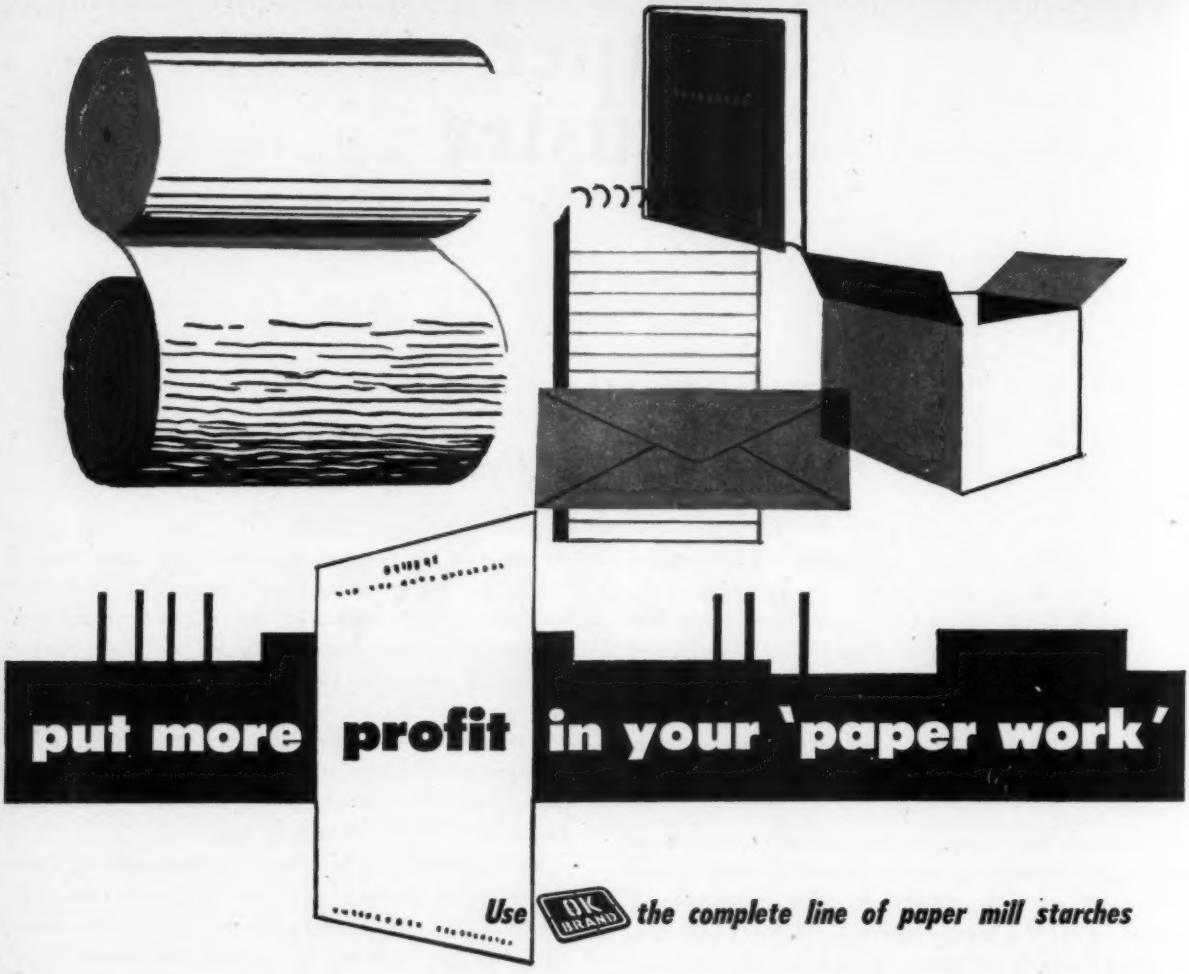
If our labor costs are higher by 300 per cent compared to those of some of our competitors, we must find ways of maintaining an increased man-hour efficiency of 300 per cent. This can be achieved only by the adoption of an imaginative and sustained training program necessarily nourished by continued interest and enthusiasm on the part of both management and labor unions.

The training program should repeatedly stress the need for a certain amount of extra exertion on the part of the employee to improve himself. While a certain amount of production know-how is bound to "rub off" through continued working association with specialists and engineers, the employee must be convinced by both management and labor union that the know-how he acquires naturally — in the course of time — comes too late to be of decisive benefit to him.

This continuous extra effort to achieve individual improvement is strongly recommended for everybody in the mill, from the operator up to and including management. The engineer, the chemist, and management should periodically analyze the personal, technical, administrative, and executive requirements of their jobs and take stock of themselves so as to permit the most productive utilization of their talents and abilities.

A necessary prerequisite to such a training program is the implementation of an effective internal communications system. Internal communications generally are being neglected in most mills. It is only through internal communications and repeated instructions that management can reach out to the employee and convince him that, without the personal effort on his part to improve himself, he simply will not reap the benefits provided by the company's training program. Nor will he, without such communications, accept the fact that his own prosperity is directly related to his productive efficiency.





The superior quality of OK BRAND starches gives you improved tub, beater, and calender sizing. Better for coating and adhesives, too. When you make better paper at no extra cost — you've put more profit in your "paper work". Try OK BRAND and see! Discuss your special starch requirements with Hubinger's expert technicians.

the stamp of quality

ESTABLISHED IN 1881

THE HUBINGER COMPANY

KEOKUK, IOWA

New York • Chicago • Los Angeles • Boston • Charlotte

Try these top-quality starches for paper makers:

- OK BRAND Pearl
- OK BRAND E-Type Pearl
- OK BRAND Pearl 700
- OK BRAND Pre-Jel
- OK BRAND Thin Boiling Starch
- OK BRAND Oxidized Starches

CURRENT COMMENTS

On the heels of '53 . . . paper and clothing . . . and financial balance

If the theory that stock market averages are a barometer of future industrial activity is correct, the paper industry is in for another record-breaking production year. With the July vacation shutdowns in effect in many mills and the year well over half concluded, paper production is but 1.2 per cent below the record for the first six months of 1953—the biggest output year in history.

At the February conventions, predictions of a 7-per cent production decline for 1954 were thought by many to be unduly optimistic. Yet, as of June 30, the output is pretty much "holding its own" and is only nominally under the record. With an increase of 2.7 per cent in capacity to come during this year, the prospect for over-capacity is non-existent; this since the normal expansion is nearly 5 per cent. The 1954 capacity increase will total approximately 302,000 tons in paper, and 458,000 tons in paperboard.

While paper has continued reasonably strong, the come-back has been most pronounced in the paperboard field. There is every indication that in both the paper and paperboard industries there is a tendency on the part of both consumers and jobbers to build up inventories. This is contrasted to an anticipated trend toward inventory reduction.

Reason for the lag

A New York publication has graphically pointed up the relation of the paper and paperboard industries to the national economy by citing the use of these commodities in the apparel field. This latter industry, which has little use for basic papers and boards, purchases annually some $78,000,000 in shipping containers, boxes and the like; other uses reach a total of $85,000,000, and the indirect flow of converted materials amounts to another $50,000,000. This single industry, therefore, provides a $213,000,000 market for the paper and paperboard industry.

Such figures represent a fairly normal year. When the apparel manufacturers have a good year, it is naturally reflected in a pick-up in paper and paperboard production. The latter of course is not immediate and demonstrates why there is a usual lag of some months between the prosperity of industry in general and comparable prosperity in paper-paperboard.

The Washington rush

The Washington scene has been one of turmoil as Congress rushes to complete as much of the Eisenhower program as possible before the scheduled adjournment. Tax legislation was rapidly being formulated with a view toward a radical revision of the entire tax system. In general, the Administration is getting what it asked for without concessions to the Democrats, who wanted changes that would have been to the supposed advantage of the tax-payer but would have paid no regard to the nation's financial balance.

In the field of foreign trade, Congress has finally passed the watered-down version of the Reciprocal Trade Agreement Program agreed to reluctantly by the White House. Instead of a law to allow further duty rate reductions in line with recommendations by the Randall Commission (of 5 per cent a year for three successive years), the law as finally passed extends the present legislation for one year. Under this law, the Administration can reduce duty rates to 50 per cent of the 1945 scale.

Some special grades of paper are possible subjects for duty rate reduction negotiations, but these appear to be confined to those grades of which Japan is the principal producer. There will be negotiations with Japan under the recently passed law, but there is understood to be an agreement on the part of the Administration to seek no further reductions for the year during which the law will be in effect. It was on the basis of such an unwritten understanding that the House of Representatives consented to the passage of any trade agreement legislation whatever.

Financial Reports

The nation's securities markets have been experiencing a boom leading to high records, and paper mill stocks have gone along with the tide. Prices as of the middle of July were in many cases higher than ever before in the industry's history.

Net incomes

Bathurst Power & Paper Co. Ltd.—Net income for the quarter ending March 31 was $432,330, compared with $277,437 for the same period in 1953.

Brown Co.—Net income for the 24 weeks ended July 19 was $2,075,220, as compared with $1,475,525 for the comparable period a year ago.

Celotex Corp.—Net income for the six months ended April 30 was $1,018,492, as compared with $1,155,195 for the same period a year ago.

Champion Paper & Fibre Co.—Net income for the year ended March 31 was $9,546,312 as compared with $8,873,918 for the previous fiscal year.

Continental-Diamond Fibre Co.—Net income for the first quarter was $85,213, as compared with $221,973 a year ago.

Crown Zellerbach Corp.—Net income for the year ended April 30 was $26,828,000, contrasted with the $21,890,000 for the previous fiscal year.

Elk Falls Co. Ltd.—Net loss for the year ended April 30 was $943,372.

Gaylord Container Corp.—Net three-month income was $1,866,000, compared with $1,754,248 for the first quarter of 1953.

General Package Corp.—Net profit for the quarter ended March 31 was $613,460, as compared to $534,856 for the same period last year.

Great Lakes Paper Co.—Net profit for the quarter ended March 31 was $642,654, compared with $556,484 for the same period of 1953.

Great Northern Paper Co.—Net income for the first quarter of 1954 was $1,146,822, as compared with $1,141,974 a year ago.

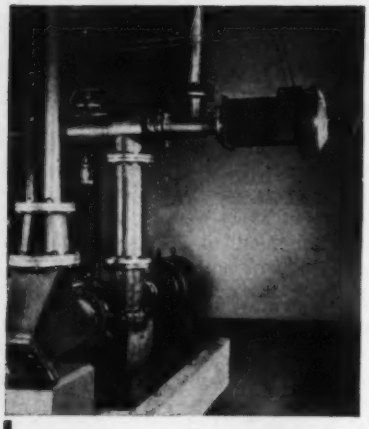
Hinde & Dauch Paper Co. of Canada Ltd.—Net profit for 1953 was $1,755,937, compared with $1,131,593 for 1952.

Hollingsworth & Whitney Co.—Net income for the first quarter was $678,979, compared with $524,712 for last year's comparable quarter.

International Paper Co.—Net income

Assure Higher Yield of More Uniform Pulp with the Chemipulp

HYDROHEATER



Heats outside the digester
No degradation of fibre
Low initial cost
Low maintenance cost

By automatically maintaining liquor temperature within 1° C., the Chemipulp Hydroheater permits accurate digester control that results in high yield and high quality.

The liquor is heated outside the digester by direct injection of the steam. An ingenious combining tube results in thorough steam-liquor mixing without the excessive noise usually caused by the sudden condensation of the steam. All of the heat in the steam is used—practically 100% thermal efficiency. A sensitive control located in the digester inlet operates the thermostatic valve in the steam line and holds the temperature within 1° C.

Compact in design, the Hydroheater actually becomes part of the piping system and can therefore be used in a wide range of locations and positions.

Chemipulp Process Inc.
Woolworth Bldg., Watertown, N.Y.

Chemipulp Process Ltd.
430 Crescent Bldg., Montreal

Pacific Coast Representative
A. H. Lundberg, Orpheum Bldg., Seattle 1

Current comments . . .

for three months ended March 31 was $15,360,968, as compared with $13,795,977 for the same quarter in 1953.

Masonite Corp.—Net income for the nine months ended May 31 was $1,878,860.

The Mead Corp.—Net income for the 12 weeks to March 21 was $1,185,188, as compared with $1,307,627 for the comparable 1953 period.

Minas Basin Pulp & Power Co. Ltd.—Net 1953 profit was $194,172, as compared to the $273,770 in 1952.

Minnesota & Ontario Paper Co.—Net first quarter income was $1,244,077, as compared with $1,293,618 in 1953.

National Container Corp.—Net income for the quarter ended March 31 was $698,446, compared with $1,039,013 for the comparable period last year.

National Gypsum Co.—Earnings for the first three months of 1954 were $2,668,258, compared with $1,878,529 last year.

National Vulcanized Fibre Co.—Net income for the first quarter was $49,628, as compared with $208,499 last year.

Nekoosa-Edwards Paper Co.—Net income for the first quarter was $620,000, about 14 per cent higher than a year ago.

Oswego Falls Corp.—Net income for the three months ended March 31 was $386,153, as compared to $372,722 a year ago.

Oxford Paper Co.—Consolidated net income for the quarter to March 31 was $806,735, compared to last year's $601,457.

Powell River Co. Ltd.—Consolidated net profit for 1953 was $9,726,308, as compared to $7,942,393 in 1952.

Puget Sound Pulp & Timber Co.—Net first quarter income was $770,124, as against $718,198 a year ago.

Rayonier Inc.—Net profit for the quarter ended March 31 was $2,814,717, compared to last year's $2,666,135.

Rhinelander Paper Co.—Net income for the six months ended March 31 was $818,652. as compared to the $650,109 for the similar period a year ago.

Riegel Paper Corp.—Net income for 13 weeks to March 28 was $448,153, compared with $384,684 for the comparable 1953 period.

St. Croix Paper Co.—Net income for the first quarter was $285,292, as compared with $257,352 a year ago.

St. Lawrence Corp.—Consolidated net profit for 1953 was $5,228,641, 15.8 per cent lower than that for 1952.

St. Regis Paper Co.—Net first quarter income was $3,949,456, compared to 1953's quarterly income of $3,760,587.

Scott Paper Co.—Net income for the first quarter of 1954 was $3,578,923, as compared with $2,711,653 in 1953.

Sorg Paper Co.—Net first quarter income was $126,134, as compared to $99,936 the year before.

Stone Container Corp.—Net income for the quarter ended March 31 was $234,600, compared with $347,800 for last year.

United Wallpaper Inc.—Deficit for the nine months ended March 31 was $2,157,936, as compared with a profit of $83,780 in the comparable period of the preceding fiscal year.

Paper mill corporate changes

Certain-Teed Products Corp. has offered to purchase at $6.50 per share 75,000 shares of Valspar Corp. This acquisition would be added to its present holdings of 245,000 shares and would give Certain-Teed working control of the firm.

Empire Box Corp., producer of cartons and paperboards, has been sold to Benjamin Coates of New York, N. Y., for $4,400,000. The sale was part of the liquidation of the estate of the late Stanley J. Klein and involves plants at Garfield, N. J., Stroudsburg, Pa., and South Bend, Ind.

Great Northern Paper Co. plans to raise approximately $10,000,00 through the sale of 100,000 shares of new preferred stock. The funds will be for the current expansion program. The directors are expected to authorize the issuance of 150,000 such shares, 50,000 of which will be held in reserve for future sale if further financing is deemed advisable.

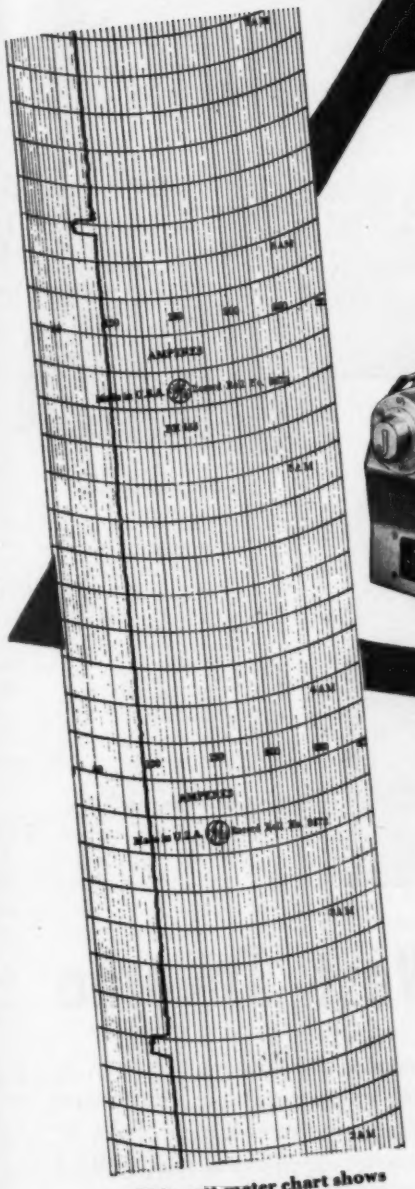
Superior Paper Products Co. of Pittsburgh has been taken over by St. Regis Paper Co. through exchange of St. Regis stock for virtually all the Superior stock. Superior will be operated as a St. Regis subsidiary with its present personnel.

Stock and Bond Quotations

Closing Prices	July 9, 1954	June 10, 1954
New York Stock Exchange — Stocks		
A.P.W.	3⅞	*2⅞-3
Celotex	22½	20¼
Same Preferred	17¼	17½
Certain-Teed Prod.	17⅞	16½
Champion P & F	46¼	38¾
Same Preferred	105	*102½-104
Chesapeake Corp.	33	32
Container Corp.	55¼	47 (New)
Same Preferred		102-102½
Continental Diamond	12½	12¾
Crown Zellerbach	48⅛	45⅝
Same Preferred	104½	103¼
Dixie Cup	57¾	51¾
Eastern Corp.	20	20⅛
Robert Gair	23⅝	21⅜
Gaylord Container	31½	29½
Great Northern P.	67¾	*63¼-64
Hammermill	18½	18⅝
International P.	75¼	66½
Same Preferred	106½	*104-106
Kimberley-Clark	66¼	60⅜
Same Preferred		*121-123
MacAndrews & Forbes	41½	*41½-42¼
Marathon	25	21⅝
Masonite	21¾	19⅛
Mead Corp.	37	34¼
Same Preferred	97	*96¼-97
National Container	13	12½
Same Preferred	23⅝	22⅞
Rayonier Inc.	37	33¼
Same Preferred	36¼	36
Scott Paper	97⅜	92
Same $3.40 Pref.	92	*89½-91
Same $4.00 Pref.	105	*102-103
St. Regis Paper	28¾	25½
Same Preferred	100¾	99
Sutherland Paper	44½	39½
Same Preferred	149	*137-140
Union Bag & Paper	59	51½
United B & C	15⅛	14⅛
United Wallpaper	1¾	1½
Same Preferred		13¾
U. S. Gypsum	172	*148-153
Same Preferred	178	*178-181
West V P & P	32¾	30⅛
Same Preferred	106	*106-109
New York Stock Exchange — Bonds		
Celotex 3¼%	99	....
Champion P & F Co. 3%	..	....
Mead Corp. 3%	..	....
American Stock Exchange — Stocks		
American Writing	15	13¾
Brown Co. Common	13	12⅞
Same $5 Preferred	104	100
Same $3 Preferred	52¼	51
Puget Sound	36¾	36½

*Closing Bid and Asked Prices

ANOTHER E.D. Jones INSTALLATION



This watt-meter chart shows uniformity of Jordan performance with Accru-Set Control.

Jones Royal Jordan (top) in Western Electric's Hawthorne Works, Chicago, has been operating under Accru-Set Control for a year. Inset shows typical control panel.

ACCRU-SET® Automatic Control makes this Jordan walk a chalk-line

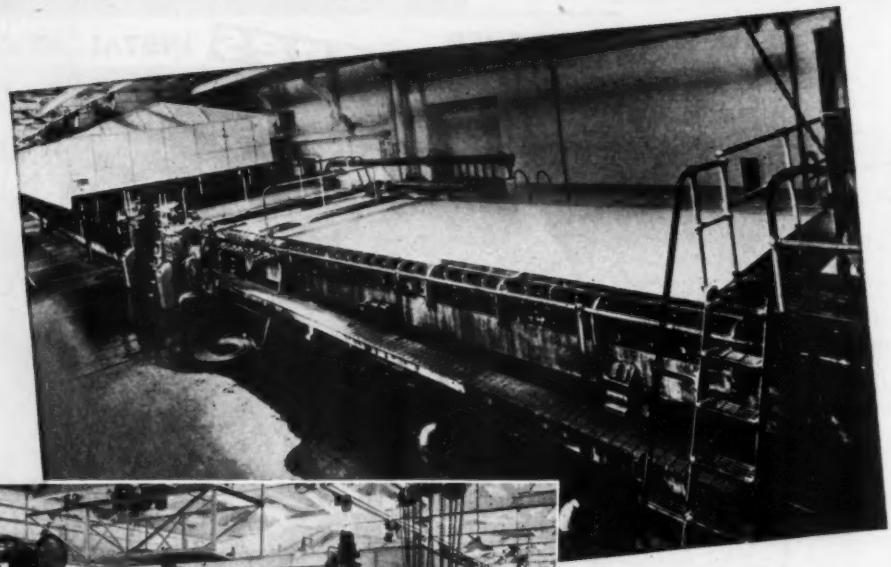
In mill after mill, Accru-Set has demonstrated its ability to maintain uniform performance at maximum efficiency — with a savings in operating horsepower — on every type of conical refining and Jordanning machine. Completely automatic control panel can be located anywhere; continuous record of every run permits exact duplication.

Ask your Jones representative for details or write today for our new Bulletin No. 1057.

E.D. Jones

E. D. JONES & SONS CO. • PITTSFIELD, MASS.

BUILDERS OF QUALITY STOCK PREPARATION MACHINERY



Machine from wet end

Machine from winder end

Newsprint Rolling at West Tacoma

When a group of publishers formed the West Tacoma Newsprint Company several years ago, Puseyjones were asked to rebuild their existing Fourdrinier Machine. Results were so satisfactory that the mill was soon ready for a new machine to meet increased newsprint demand.

Puseyjones developed exactly the machine that the owners wanted — not a giant as newsprint machines go, but a modern, medium-size newsprint machine designed to operate at speeds consistent with mill requirements.

Whatever your machine requirements may be — new machine or modernization, Fourdrinier, Cylinder, Yankee, or a combination of any of these — Puseyjones experience is freely offered to help you get the results you want. Our district representatives are factory-trained engineers, glad to be of service to you on any machine problem, large or small.

THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery
Fabricators and Welders of all classes of Steel and Alloy Products
Wilmington 99, Delaware, U.S.A.

NEWS of the INDUSTRY

Japanese Alaska Project Aimed at Supplying Home Islands' Needs

THE ACUTE SHORTAGE of paper and other forest products in Japan can be eased by the construction of manufacturing facilities in Alaska. In a letter to THE PAPER INDUSTRY, Junichiro Kobayashi, president of Alaska Pulp Co. Ltd., declares that if the present plan is realized "it will more or less mitigate the shortage of forest products and the incidental over-cutting of forests in Japan."

Alaska Pulp Co. was incorporated in Tokyo in August 1953 for the purpose of meeting Japan's lumber and pulp shortage. Cooperating in the venture were producers of synthetic fiber, paper, pulp and lumber. In December of that year the incorporation of Alaska Lumber & Pulp Co. Inc. was completed at Juneau. The authorized capital was $1,000,000 (U. S.).

Explaining the long-range goal of Alaska Lumber & Pulp, Mr. Kobayashi said that "the project consists of first operating a sawmill and then constructing a pulp mill, thereby achieving integrated operations. . . . So far as sawmill operations are concerned, it has been decided to operate the Wrangell Island mill of Alaska Wrangell Mills Inc. on a rental basis, the lease agreement having been recently signed by the parties concerned."

Mr. Kobayashi revealed that partial repairs and improvements planned for the Wrangell operation were to require approximately three months. Actual production is expected in September, with the entire output intended for Japanese use exclusively.

100,000-ton pulp mill

"So far as pulp mill operations are concerned," he continued, "a technical survey team is expected to visit Alaska in August; a design for the pulp mill construction will be prepared after the result of such a survey is obtained. Under the circumstances, the size of the proposed mill and manner of production have not been definitely established. However, it is planned that a mill with an annual capacity of 100,000 tons of pulp will be built and ready for operation by 1958."

On May 24 the U. S. Forest Service formally accepted Alaska Lumber & Pulp's application for the right to purchase national forest timber in the Sitka area. Mr. Kobayashi's statement to the Forest Service pointed out that the financing of the proposed pulp mill will be a joint project of Japanese and American capital.

"The foregoing plans have been steadily put into shape thanks to the sympathetic attitude of the American government and local authorities, as well as to the strong support of the Alaskan people," Mr. Kobayashi concluded. "In order to respond to such good will and favorable support on the part of the United States, Alaska Pulp Co. Ltd. in Japan is exerting its utmost efforts to complete the proposed undertaking as early as possible. It is hoped that this will eventually lead to establishing a more compact economic relationship between the United States and Japan."

New Building Board Development to be Manufactured at $750,000 Plant

PACK RIVER LUMBER Co. of Sand Point, Idaho, has started construction of a $750,000 plant to manufacture a building board from sawmill wood waste.

The board, primarily for interior use, is a development of James d'A. Clark, Longview, Wash. research and development engineer. The process has been developed during the past two and a half years at Pack River's research laboratory.

According to research engineers, the board is one of the strongest and most versatile of those being manufactured from sawmill waste. The Clark process, however, does not employ sawdust. Slabs and edgings that now go to the sawmill burner, as well as dead timber and tops that cannot now be economically taken from the forest, will be used.

The board's properties approach those of natural wood, since only relatively thick wood wafers and a small quantity of resin are used in its manufacture. The wafers average about 1½ in. in length, 1 in. in width, 1/32 in. in thickness.

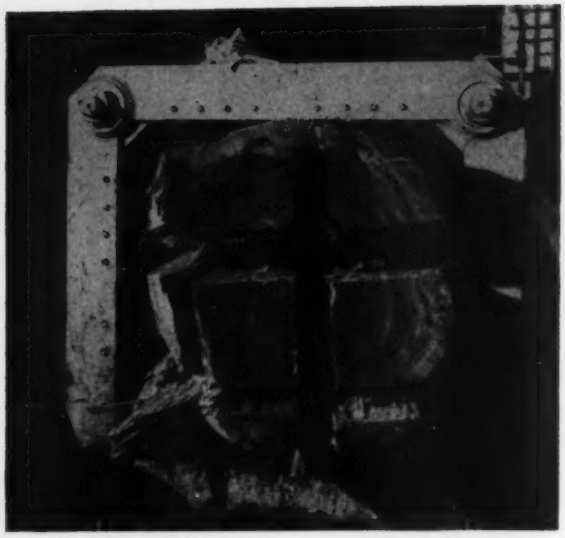
The product will be manufactured in 4- by 16-ft. sheets. Thickness can range from 1/48-in. to 6 in.

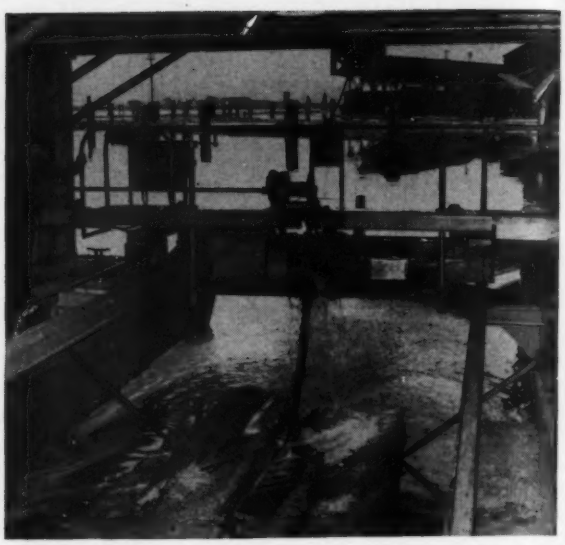
In a letter to THE PAPER INDUSTRY, Mr. Clark has described the development:

NEW BUILDING BOARD that is to be produced in a plant now under construction in Idaho; the inventor, James d'A. Clark, displays two of the many surface varieties that will be manufactured

"The new board has similar properties to plywood except that it is a little denser. In fact, it is a multi-plywood; but, unlike plywood which needs select logs for its manufacture, the new board can be made from any kind of woods waste or sawmill scrap.

"Every single piece of equipment for the entire process—a dry process—is of new design, even the multi-





THE EFFICIENT USE OF all the forest harvest is the primary purpose of these two recent developments at the Everett, Wash. lumber division of Weyerhaeuser Timber Co.: the hydraulically powered log splitter (l) handles logs up to 42 in. in diameter and splits them to a maximum width of 12 in.; the floating rip saw (r) halves and quarters logs 6 ft. in diameter and larger

Weyerhaeuser Improves Whole-Log Utilization

A hydraulically powered log splitter and a 12-ft. floating rip saw, both of which incorporate unique design features, are helping Weyerhaeuser Timber Co.'s Everett, Wash. lumber division improve whole-log utilization. At the same time, the developments aid in speeding the handling of oversize logs.

Designed and developed by local Weyerhaeuser personnel, the new machines, according to the firm, "represent a further step in the efficient use of all the forest harvest."

The hydraulic log splitter develops 65-tons pressure using water from the hydraulic barker pumps. Operating on a hydraulic ram principle, the splitter forces 8-ft. logs through four knives arranged in a criss-cross—or tic-tac-toe—pattern. Logs up to 42-in. diameter are split to a maximum width of 12 in. The split pieces can then be chipped and conveyed to the adjacent Weyerhaeuser pulp mill.

Cleaner sawmilling operation

"The Mill 'C' splitter gives us a rapid, efficient method of handling logs not suitable for making lumber," explains L. N. Reichmann, manager of the lumber division. "One resulting advantage is a cleaner sawmilling operation, since this pulp-destined wood never reaches the headrig but is conveyed directly from the barker to the splitter and from there to the chippers."

The 12-ft. rip saw is housed in a covered shed that is mounted on pontoons to provide a floating platform. Located on the log pond, the big chain saw rips huge logs down the center. Logs 6 ft. in diameter and larger, too big for efficient handling by the headrig, are halved and quartered in a fraction of the time it formerly took to do the job with wedges and sledges.

Logs are floated into position between the two pontoons, locked in place with pins from each side, and then ripped by the chain saw which moves the length of the shed.

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opening press that has a piston the size and shape of the boards—about 4 by 16 ft. for the new press. All the equipment has been designed, built and thoroughly tested at the demonstration plant, (which) is completely automatic and turns out 4- by 4-ft. trimmed samples."

A uniform mat of wafers mixed with resin is subjected to intense pressure and heat to form the board, which can be faced with any species of wood wafer to achieve novel and unusual effects.

50% more of the wood

"Use of the Clark process in converting what is now wood waste to a versatile building product will make it possible for us to use about 50 per cent more of the wood in logs," declared J. M. Brown Jr., president of Pack River Lumber.

Site of the new industry is in Dover near Pack River Lumber's planing mill on the Pend Oreille River. The plant is expected to be completed and in production by the summer of 1955. Approximately 50 persons will be employed.

•

Paper and Pulp Firms Boost Forest Spending

From 1945 to 1952 the nation's pulp and paper companies increased their expenditures for forest management work by approximately 240 per cent. According to the American Pulpwood Association, the 1945 spending came to $4,000,000, while that for 1952 amounted to $14,400,000.

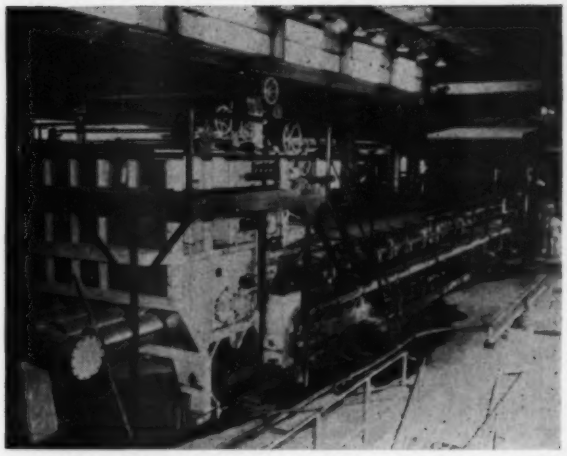
The report—based on a survey of 171 pulp and paper firms in the United States—declares that despite the increase, only three out of every 26 cords of pulpwood used came from company-owned forests. (The 171 companies operate 252 pulp-consuming mills.)

"The primary cause of the striking increase in forest management spending is the rapid rise in company forestry programs," according to W. S. Bromley, executive secretary of APA. The programs are based primarily on the furnishing of technical services to tree farmers and on the improvement of company-owned forests.

In 1952 the pulp industry owned 25,800,000 acres of timberland, as contrasted to the 17,900,000 in 1945.

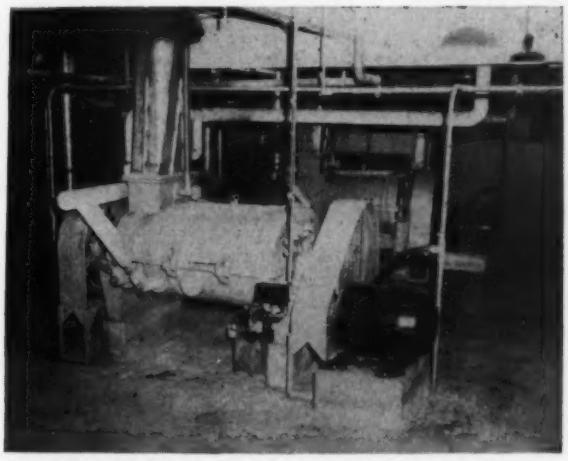
About 63 per cent of the pulpwood used during the past three years came from private landowners, many of them small, and not from the industrial forests supported by pulp and paper manufacturers. Government lands and imports each accounted for about 9 per cent of the total.

BLEACH PLANT and high-density chest at Pensacola



RECONSTRUCTED PAPER machine from the wet end

BLEACH WASHERS and control consoles on fifth floor



CHEMICAL MIXERS in new St. Regis bleach plant

$5,000,000 Florida Expansion Project Completed by St. Regis

INCREASED FLEXIBILITY has been the result of a $5,000,000 expansion program recently completed at the Pensacola, Fla. Kraft Center by St. Regis Paper Co. The project—initiated in September 1953—makes it possible to produce both bleached and unbleached grades of kraft.

The expansion consisted of four major phases: (1) construction of a five-stage bleaching plant; (2) an increase in water supply facilities; (3) an extension of the screen room, and (4) the modernization of No. 1 paper machine for the production of bleached fourdrinier grades.

Bleach plant

The capacity of the new bleach plant is a daily 250 tons, which is more than triple Pensacola's former capacity. Operations of the entire plant are controlled from an up-to-date instrument panel by a three-man team. Three miles of instrument tubing connect the control valves and instruments.

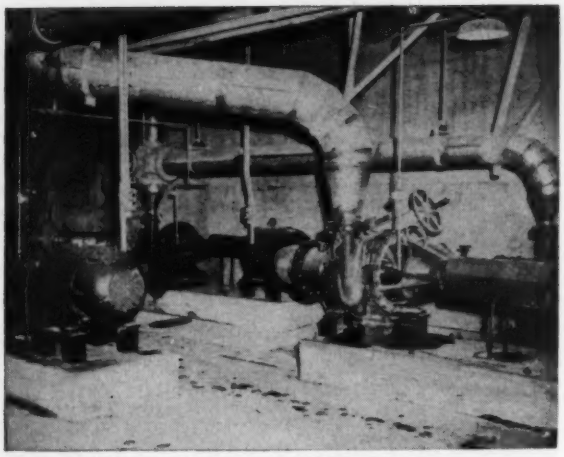
The control room is air conditioned. The top two floors of the five-story plant are of brick and glass construction. An unusual ventilation system filters all air entering these floors as well as the air blown into the electrical control room. Exhaust ducts distribute air to the relatively air-tight rooms, while fans are used for a positive exhaust.

At the present time, the plant is equipped to handle five bleaching stages: chlorination, first caustic, first hypochlorite, second caustic, and second hypochlorite. Provision has been made for a possible sixth bleaching stage. Bleach liquor-making facilities have been converted from a batch system to a continuous and automatic system.

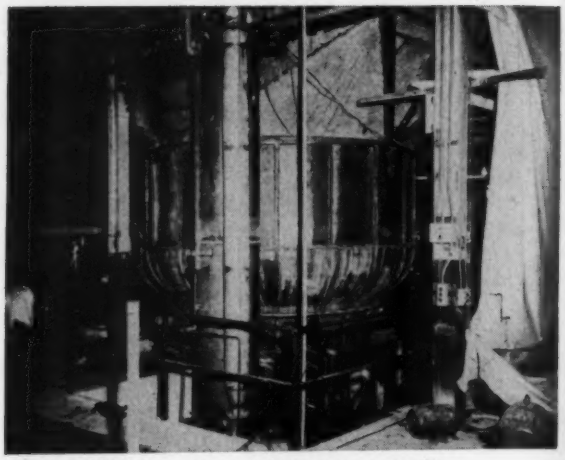
All bleach plant piping is of stainless steel. The washer vats are tile, and all towers and tanks are tile-lined. Water entering the plant is filtered to exclude rust.

An arrangement for a divided flow of stock makes it possible to run stock of varying characteristics and degrees of bleaching and to serve the fourdrinier and cylinder machines separately. Stock is moved by conveyors to two high-density storage tanks, one tile-lined and the other of tile block. Each tank is approximately 60 ft. high.

From these tanks the stock moves to one of the paper machines. Oscillating nozzles for sluicing, installed near the tank bottoms, make it possible to introduce water for diluting the stock so that it can be removed by pumping. The tanks provide storage



STOCK PUMPS and dilution chests at Pensacola



HYDRAPULPER for reconstructed No. 1 paper machine

of approximately a 24-hour reserve stock supply.

Fourdrinier paper machine

Reconstruction of the No. 1 paper machine at Pensacola was undertaken to make possible the handling of a 100-per cent bleached product, as well as to increase its capacity. The reconstruction was accomplished in slightly over two months.

The unit was almost completely rebuilt, and a number of new parts were added for the machine extension. The rebuilt machine consists of a new headbox, an extended fourdrinier to provide greater flexibilty, a suction first press, a new second inverse type press, a smoothing press, and an extended dryer section. The latter boasts a total of 60 dryers arranged in four sections with a breaker stack between the first and second sections, a size press between the third and fourth sections, and dryers added between the two calenders. The original reel and winder were retained by moving them forward.

Provision has been made for complete installation of drying and moisture control equipment for the paper and a condensate removal system.

A new motor generator set and added individual sectional drive units were installed along with the control board and individual regulators.

A number of alterations and additions were made in the stock preparation department to provide for the increased capacity of the rebuilt machines. These included changes in the mixing chest and agitating equipment, as well as the addition of larger pumps. A complete new system of stainless steel piping for handling stock and white water in the mixing process was also installed.

Heating and ventilating equipment, designed by J. O. Ross Engineering Corp., provides for vapor absorption and for the air conditioning of the building.

Screen room

Capacity of the new screen room is a daily 250 tons, which is sufficient to handle all pulp for bleaching at the Pensacola operations. The fine mesh of the screens provides for a high-grade product. The Linblad screens and deckers occupy less space than did the older type. Also used in the screen room are stainless steel pipe and tile storage facilities.

Engineering design for the reconstruction program was done by the St. Regis engineering division. The actual construction work was by Tidewater Construction Corp.

Pensacola equipment suppliers

Suppliers of major equipment for the St. Regis project were as follows:

No. 1 paper machine—**The Black-Clawson Co.**

Screens, washers and accessories—**Improved Machinery Inc.**

Electrical equipment—**Westinghouse Electric Corp.**

Stainless steel—**Allegheny Ludlum Steel Corp.**

Heating and ventilating—**J. O. Ross Engineering Corp.**

Pumps—**Goulds Pumps Inc.** and **Warren Steam Pump Co. Inc.**

Water improvements and extensions—**Layne & Bowler Co.**

Hydrapulper and agitation—**Shartle Bros. Machine Div., The Black-Clawson Co.**

Claflins—**Emerson Mfg. Co. Div. of John W. Bolton & Sons Inc.**

Dirtecs—**Bird Machine Co.**

Tile Tanks—**Stebbins Engineering & Mfg. Co.**

Steel tanks—**Chicago Bridge & Iron Co.**

Instrumentation—**Mason-Neilan Regulator Co., Taylor Instrument Companies** and **the Foxboro Co.**

Headbox—**Valley Iron Works Co.**

•

Firm Salvages Process Equipment Through Maintenance Impregnation

Extension of the productive life of processing equipment through maintenance impregnation is now an accomplished fact at Stevens & Thompson Paper Co. of Greenwich, N. Y. This according to engineers of American Metaseal Mfg. Corp. of West New York, N. J. The Metaseal process completely seals all the microscopic pores in metals, the firm reports, thus preventing "hidden leaks" due to internal corrosion in fluid handling equipment such as pumps, valves and other equipment.

Complete impregnation of leaky metal parts not only stops the leak but also extends the useful life of the unit by eliminating corrosion. Impregnating problems vary considerably because of the many different types of porosity, and impregnating methods vary with the physical set-up and available facilities.

In the case of Stevens & Thompson, it was found that a drying drum leaked in the area around the journal. Examination showed that the drum had been brazed on the inside to secure the plate, which holds the journal, to the inside of the drum. Because of the size of the equipment (6-ft. diameter and weighing more than 7 tons), the drum itself was used as the impregnating vessel.

14-step process

First step in the process was to drain residual water from the drum, followed by pressurization with steam and a check for leaks. Then vacuum

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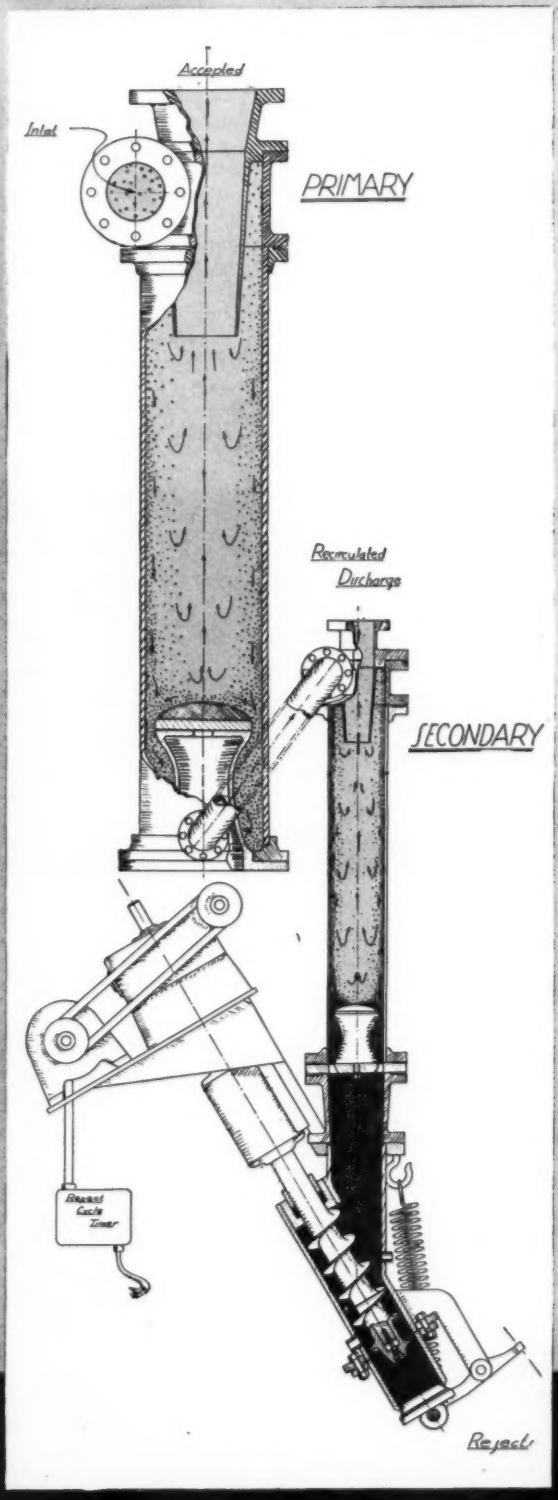
1954

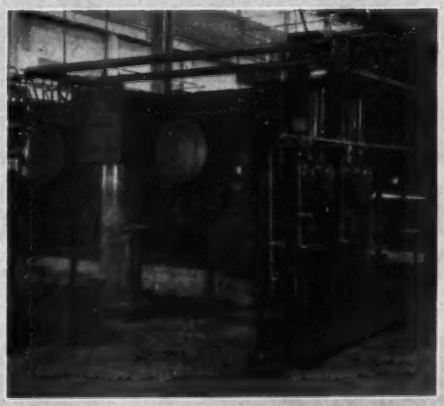
BIG JOBS OR SMALL

THE DIRTEC BEATS 'EM ALL

— when it comes to thorough separation and complete removal of dirt from stock



The "King Size" Dirtec (12″ primary and 4″ auxiliary) has a capacity of 1400 gallons per minute. This cross section sketch shows how it works when handling big volumes of heavy, coarse dirt taken out of board stock. It may be equipped with a continuous dirt evacuator, as shown.



These Dirtecs, with 6″ primary and 2″ auxiliary, are applied to Bird Screen tailings, one Dirtec unit per Screen, and handling up to seven tons of screen rejects per day.

Dirtecs are extraordinarily effective, dependable and economical whether used on pulp or board stocks, ahead of the paper machine on all grades of stock, or as tailings units for Bird Screens.

BIRD MACHINE CO.

SOUTH WALPOLE, MASS.

was pulled and the impregnant drawn in. The stress involved prevented any outside patching. Steam was introduced into the drum to heat and exert pressure on the impregnant, causing it to issue from the leaks in the drum and around the trunnion. This process was continued until all leaks stopped.

A careful check for leakage revealed successful impregnation. The impregnant was pumped out with steam pressure, after which the drum was washed, using a fire hose through the manhole. After replacing the manhole cover, steam was reintroduced to reheat the drum, then quickly drained. With the cover again removed, compressed air was played over the hot metal to dry the section where leakage had occurred.

The cover was finally replaced, the drum pressurized with steam and a final check for leaks made. None was found, and the machine was put back into operation.

PROJECT SIMILAR to that at Stevens & Thompson has been undertaken at Felt Process Co. in Jamaica Plain, Mass., where a drying drum (48-in. diameter with 60-in. face) leaked sufficiently to interfere with drying; shown in the photograph taken during "treatment" are the barrel containing impregnant (left), vacuum pump (center bottom), and the leaky drum (right middle)

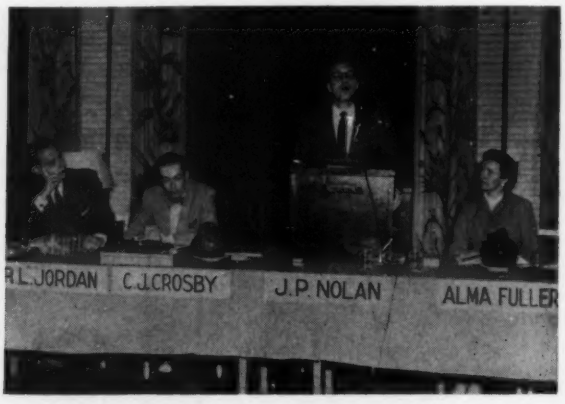
Seven Mills Fined in Canadian Combines Case

Seven paper mills were among 29 defendants recently convicted in Ontario Assize Court for a 20-year conspiracy to fix prices and restrain competition. Others assessed a total of $242,000 in fines included 20 incorporated wholesalers, one unincorporated wholesaler and the secretary of the fine paper wholesalers' association.

The defendants immediately filed notice of appeal against the conviction.

Fined the maximum of $10,000 were Howard Smith Paper Mills Ltd., the E. B. Eddy Co. Ltd., Provincial Paper Ltd., Rolland Paper Co. Ltd., Alliance Paper Mills Ltd., Don Valley Paper Co. Ltd. Canada Paper Co. was fined only $4000 because it went out of the fine paper business in 1940.

COMMUNITY RELATIONS IN ACTION—A gift of the Champion Paper Foundation, this ultra-modern public library at Canton, N. C., was dedicated in recent ceremonies; more than 500 persons witnessed the event; participating were (front row, l to r) Brandon P. Hodges of the Champion Paper & Fibre Co., Gov. William B. Umstead, and Reuben B. Robertson, Champion's board chairman; (rear row, l to r) Dwight J. Thomson, vice president of Champion in charge of industrial and public relations, the Rev. Harold Groce, Reuben B. Robertson Jr., president of Champion, H. A. Helder, Champion vice president and manager of the firm's Carolina division, and C. A. Stone, vice president of Champion and chairman of the library board of trustees



PAPER MILL OFFICIALS gathered recently to discuss two phases of community relations activities; the occasion was a meeting of the Northeast Community Relations Forum, which is sponsored by the American Paper & Pulp Association; participating were mill representatives from Maine, New Hampshire and Vermont; the opening panel discussion concerned itself with the activities of the pulp and paper industry in the promotion of good forestry practices; taking part in a discussion of cooperation between the industry and the schools and the clergy were (l to r) R. L. Jordan of General Electric Co., James P. Nolan of Oxford Paper Co., C. J. Crosby, guidance director for Stephens High School in Rumford, Maine, and Alma D. Fuller of AFPI

Scope of APPA Community Relations Program Grows; New Report Issued

THE APPA-SPONSORED community relations project is finding widespread popularity throughout the country as pulp and paper firms are establishing individual programs as a part of the national goal: "To prove to the general public that the industry intends to be a good corporate citizen and neighbor."

Large and small companies alike are devising local projects whereby they may improve their relationship with the community. Such programs range from the construction of public gymnasiums and swimming pools to plant tours and special editions of the local newspaper.

The national project has grown tremendously since its inception in 1948, with 11 regional community relations committees formed to organize and plan individual activities.

Periodic reports are submitted to APPA by participating firms. These are published in the association's *Community Relations Progress*. Highlights of recent months:

Crown Zellerbach Corp. has devised a four-point plan for sharing with the public information regarding its own affairs and those of the pulp and paper industry in general. This has included (1) securing 20,000 reprints of the *Readers Digest* April story, "Farewell, Paul Bunyan," which told of C-Z's tree farms; (2) printing 12,000 of its own Management Digest

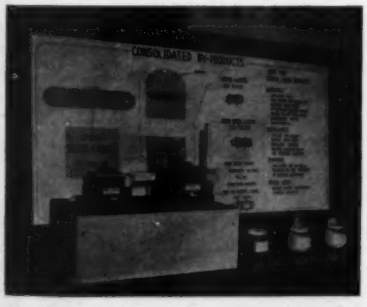
containing a complete list of scholarships offered by the Crown Zellerbach Foundation; (3) securing permission from the publishers of *Nation's Business* to duplicate and distribute its two-page May story, "Paper—Third Fastest Growing Industry," and (4) producing a 32-page annual report of the C-Z Retirement Plan.

These publications were distributed by Crown Zellerbach to selected lists, including employees, community leaders, union officers, ministers and educators.

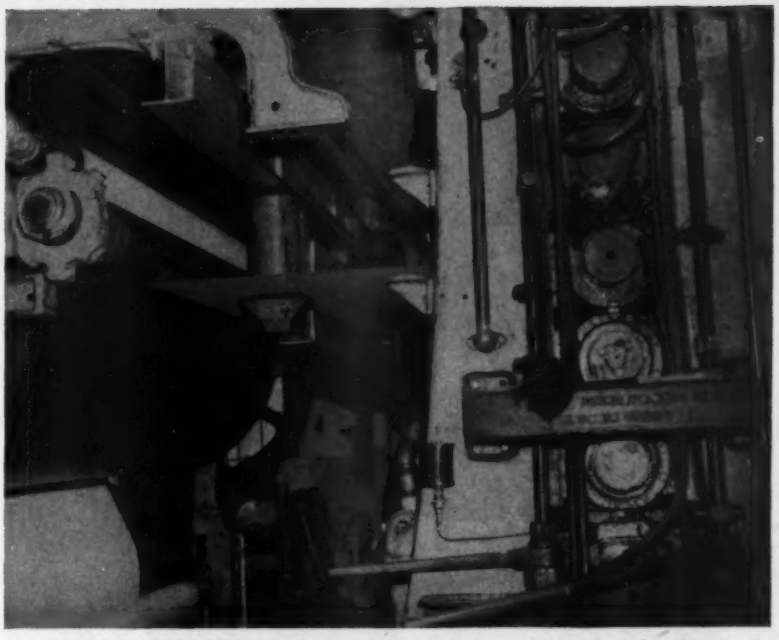
New York & Pennsylvania Co. of Johnsonburg, Pa., has refurbished the community park that it maintains for the public. The area was reseeded and sprayed against insects. The park, which was donated by New York & Pennsylvania, is served during the summer season by a company-paid attendant.

Ecusta Paper Corp. of Pisgah Forest, N. C., is taking part in a series of classification panels for two local high schools. The principal purpose is to acquaint students with possible fields of employment. Among the topics discussed are various occupations; the amount of training necessary; where such training can be obtained; the opportunities for advancement; top limit of earnings, etc.

Both the sons and daughters of employees at **Sonoco Products Co.**, Hartsville, S. C., may now participate in the summer training program offered by the firm. Previously, only sons were eligible. Those taking part must be students whose background, training and aptitude indicate that they may later hold positions with Sonoco. The program provides practical training during a six-week period, gives students an opportunity to determine the work for which they are best suited, and makes available some financial aid for those who plan to continue their education.



ALMOST 20,000 visitors saw this scale model sulfite pulp mill during the 50th anniversary celebration of Consolidated Water Power & Paper Co. at Wisconsin Rapids, Wis.; an example of community relations effort, the display was aimed at acquainting the public with the workings of a modern plant and its by-products; the working model depicted the entire process from peeled log to pulp to by-product



A 50-PER CENT REDUCTION in basis weight variance across the sheet has been made possible at Beckett Paper Co. by the use of a traversing AccuRay beta gauge; according to Thomas R. Friedrich, technical director of the Hamilton, Ohio plant, Beckett is the first firm to utilize the continuous scanning method of securing continuous sheet level readings; the overhead-mounted AccuRay is capable of measuring completely across a 100-in. sheet; the beta gauge is the product of Industrial Nucleonics Corp. of Cleveland and is mounted between the last dryer roll and the calender stack

•

Crossett Plans Use of Oak in New Arkansas Mill

Crossett Paper Mills has opened bids for a proposed $16,000,000 mill. The Crossett, Ark. plant will use oak in the manufacture of bleached food board.

According to the firm's engineers, oak has never before been used for this purpose. Scheduled for completion in October 1955, the mill will utilize a process calling for a mixture of pine and hardwood. Approximately 75 per cent of Crossett's vast timber holdings consists of oak.

•

Scott to Acquire Assets of Detroit Sulphite

Thomas B. McCabe, president of Scott Paper Co., and George N. Carleton, president of Detroit Sulphite Pulp & Paper Co., have announced that the two firms have entered into an agreement whereby Scott is to acquire all the assets of the Detroit, Mich. company in exchange for 125,092 Scott common shares.

This is on the basis of three common shares of Scott for five shares of Detroit Sulphite common.

Detroit Sulphite Pulp & Paper owns and operates a 150-ton bleached sulfite pulp mill, six paper machines, and converting equipment. It also has a wholly-owned Canadian subsidiary with substantial timber holdings in Ontario. Mr. Carleton will continue as principal operating executive.

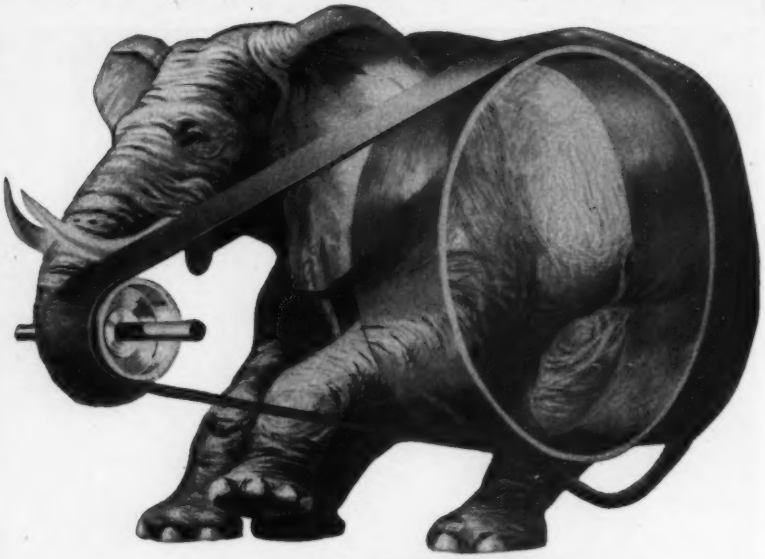
•

Ketchikan Pulp Mill Dedicated

Ketchikan Pulp Co. has officially dedicated its $52,500,000 mill at Ward Cove in Alaska's southeastern panhandle. Present for the ceremonies were government officials, financiers and industrialists. It is reported that the pulp mill is the first of several to be based on the huge timber resources of the Tongass national forest.

Gov. B. Frank Heintzleman, who as a forester in the territory for 36 years had been planning and working for the project, asserted that the forest could support four mills the size of the Ketchikan operation on a perpetual yield basis.

Ketchikan Pulp is a joint enterprise of American Viscose Corp. and Puget



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G&K Leather Belting grips the pulleys for more production-power

It Grips — Like an elephant's trunk, leather's resilient, frictional surface firmly *grips* the pulley face, causing belt and pulley to move as one power unit.

It Pulls — Leather is strong, flexible, with controlled stretch — gives peak performance on *any* drive.

It's 3-Dimensional — Leather's millions of fibres are interlaced to form the tough *three-dimensional* structure so necessary for PULLINGRIP — *developed to the highest degree in G&K Leather Belting.*

Call your G&K Industrial Supplies Distributor for flat, round, link and V-belting, belt lacing, dressings, cements, packings and specialty leathers. Write for free Belting Catalog 101.

GRATON AND KNIGHT

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Memo: **Paper Mill Superintendents**

Here's a drive you can depend on — if the belting is G&K leather. Every drive in the mill — from beaters to take-off reels — must keep pulling at top efficiency with minimum stretch. That's why superintendents specify G&K RESEARCH® brand for top tonnage output.

GRATON & KNIGHT *Company*

WORCESTER, MASSACHUSETTS

World's Largest Manufacturer of Industrial Leather Products

News of the Industry . . .

Sound Pulp & Timber Co. It is turning out pulp for rayon and high-grade paper at the rate of 300 tons per day. The eventual capacity may be as high as a daily 500 tons.

The mill, which employs the magnesium bisulfite process, will draw upon stands totaling 8 billion board ft. of salable timber allotted to it by the U. S. Forest Service.

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Bowaters Southern in Operation in Tennessee

The $55,000,000 pulp and paper mill of Bowaters Southern Paper Corp. at Calhoun, Tenn., has entered production. Two years to the day after the ground-breaking, the plant announced its initial shipment—nearly 3000 tons of sulfate pulp.

When in full production, the mill will turn out an annual 130,000 tons of newsprint and 50,000 tons of unbleached and semi-bleached sulfate pulp. More than 650 persons were on the payroll at the end of June. Officials predicted that eventually this figure will increase to 750.

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Textile Paper Products Plans Crossett Plant

Work has started in Crossett, Ark., on a new $80,000 paper products manufacturing plant being built by Textile Paper Products Inc. The announcement was made by G. H. Edwards, president of the firm, at the Cedartown, Ga. headquarters.

The structure, which is scheduled for completion in September 1954, will contain 11,000 sq. ft. designed for future expansion. The converting plant will produce paper tubes, cores, and other paperboard products used by the pulp and paper industry and textile plants.

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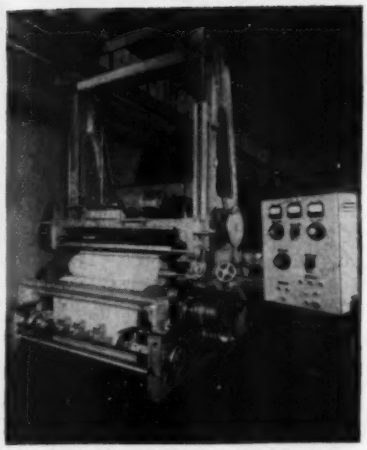
Industry Expansion Notes

Longview Fibre Co. will build a $1,000,000 corrugated box plant in Seattle, Wash. According to R. S. Wertheimer, vice president, equipment for the operation has been purchased. He said that 150 persons will be employed when production gets under way in the spring of 1955. W. Q. Reiniger, office manager of the Longview container plant, will serve as resident manager. The superintendent will be John W. Clarke.



65-INCH MILL WINDER to be installed in the mill finishing room of Nekoosa-Edwards Paper Co. at Port Edwards, Wis.; a product of Kidder Press Co. Inc., Dover, N. H., the unit is capable of unwinding and rewinding 60-in. diameter rolls at speeds up to 4000 fpm and can handle stocks varying from 26 to 91 lb.

Arkell & Smiths has purchased the Hudson Falls, N. Y. bag plant formerly operated by Union Bag & Paper Corp. The latter firm will continue to act as selling agent. The purchase did not include the honeycomb operation, the product development research laboratory or the machine shop.

Chemical Paper Mfg. Co. at Holyoke, Mass., has installed soot arrestation equipment at a cost of more than $10,000.

Kieckhefer Container Co. has announced a $500,000 expansion program at its Tampa, Fla. shipping container plant. The project, which will include the installation of new machinery and the enlargement of the plant, will be undertaken by S. S. Jacobs & Co. of Jacksonville.

Central Fibre Products Co. Inc. has authorized the construction of a new converting plant to house the corrugating, folding and set-up departments of its Omaha (Neb.) division. It is hoped that operations will begin early in 1955. The location, adjacent to the Missouri River, was chosen with plans in mind for the eventual construction of a paperboard mill.

Gardner Container Co., newly formed subsidiary of the Gardner Board & Carton Co., will build a $1,000,000 plant at Medina, Ohio. Operation is expected in 1955. Design-engineers for the unit will be J. E. Sirrine Co. of Greenville, S. C.

The Ohio Boxboard Co. of Rittman, Ohio, has announced the acquisition of Empire Box Corp. of Illinois at South Bend, Ind. (with sales offices in Chicago.)

(Turn to page 470)

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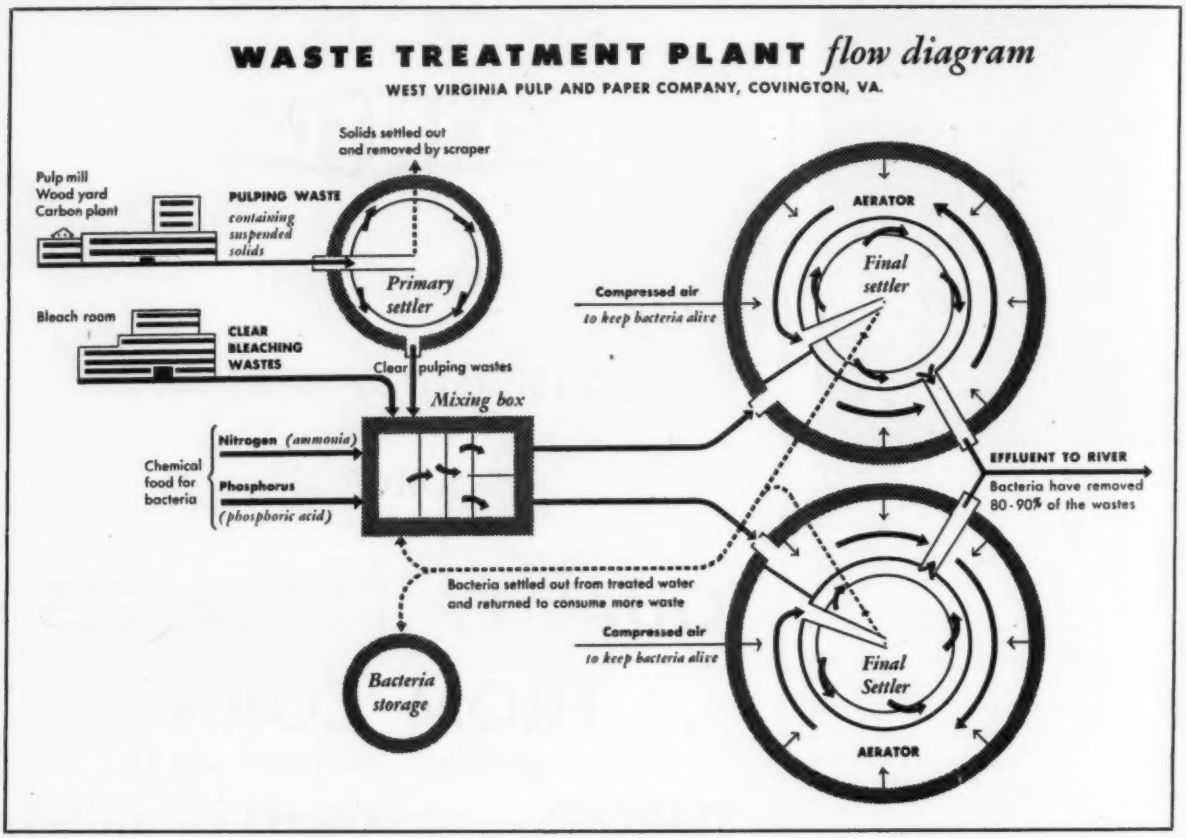

SIMPLIFIED FLOW DIAGRAM showing how new West Virginia Pulp & Paper waste treatment plant operates; during the process, bacteria and other micro-organisms feed on organic materials in the wastes, removing from 80 to 90 per cent of the harmful matter

Large Scale Pollution Reduction Expected in $2 Million W. Va. Project

A LARGE SCALE REDUCTION in the pollution load at the Covington, Va. plant of West Virginia Pulp & Paper Co. is the goal of a recently announced $2,000,000 project. Preliminary construction work on the proposed waste treatment plant has started.

Designed for a maximum capacity of 24,000,000 gal. per day, the installation will treat wastes from the mill's woodyard, pulp mill, chemical plants, the first two stages of the bleaching operation, and the carbon plant. At present, the volume of wastes from these sources approximates a daily 16,000,000 gal.

Long-range research and experimentation have indicated that under actual operating conditions the new plant will remove up to 90 per cent of the harmful solids and organic materials. (Effluents from the paper mill are scheduled to undergo separate treatment process.)

Because no practical method of treating pulp and paper wastes had been developed, earlier pollution abatement activities at Covington were directed toward prevention of wastes at their source. This program of process changes and improvement has restored to a normal state about 20 miles of the stream previously polluted.

First on a large scale

Following several years of intensive research and experimentation, the finer details of the unit were worked out by Dr. W. W. Eckenfelder of Weston, Eckenfelder & Hood; and in September 1953 the engineering design of the treatment plant was begun by Gibbs & Hill of New York, N. Y. The engineering data was completed and approved in May 1954, and the contract for construction was let to Tidewater Construction Co. of Norfolk, Va.

The waste treatment plant will be the first in the country to effectively treat wastes from the sulfate pulping process on a scale as large as that required at Covington, where more than 700 tons of paper and paperboard are produced each day.

The plant will duplicate under controlled conditions nature's function in treating mill wastes, removing the harmful solids and dissolved organic materials from the liquid wastes after a treatment ranging from 5 to 7½ hours.

Five-step process

As a first step in treatment, the mill wastes are run into a primary settling tank, where all the solids are settled out during a retention period of about two hours.

The liquid portion of the wastes then is pumped to a mixing box that has been "seeded" with bacteria and other micro-organisms. The key to the process lies in providing a balanced diet upon which the bacteria can thrive. This is accomplished by adding quantities of phosphorus and nitrogen to the organic materials contained in the waste waters.

The waste liquids, the added chemicals, and the gelatinous mass of bacteria—which is called "activated sludge"—then are pumped to deep aerating channels. For a period of three hours the bacteria consume the

organic materials in the wastes, kept active by oxygen supplied by the air pumped into the channels. By the end of this period, the bacteria have consumed from 80 to 90 per cent of the harmful organic material in the wastes.

The aerated material then is sent to a final settling tank, where the activated sludge settles during a three-hour retention period, leaving the clear water behind. The settled sludge is then returned to the mixing box for re-use, or to an excess sludge storage tank, and the clear water is released to the stream.

The Covington installation includes one primary settling tank measuring 100 ft. in diameter, with side water depth of 12 ft.; and two activated sludge units measuring 175 ft. in diameter, which includes two aeration channels 25½ ft. in width and 15 ft. in depth and two inner settlers 120 ft. in diameter and a little over 11 ft. deep at the side. The sludge storage tank, which has a 24-hour capacity, is 50 ft. in diameter and 20 ft. deep.

Every stage of the process will be scientifically controlled by a complex system of instrumentation. The system will be operated from a central start-stop control console, which is to be equipped with two alarm systems to warn of any process trouble the instant it occurs.

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Paper Machine Symposium Program Announced

The basic principles of paper machine operation will be discussed by experts from Europe and North America at a forthcoming symposium to be held at the Institute of Paper Chemistry in Appleton, Wis. The program, "Fundamentals of the Paper Machine," will be staged September 20-24.

Co-sponsors of the project are the fundamental research committees of CPPA and Tappi. The symposium will have for its objective the preparation for publication of a series of related papers and discussions dealing with the over-all subject.

Registration, which will be limited to 200, was to close August 15 and will not be accepted at the time of the meeting. All inquiries are to be sent to Harry F. Lewis, chairman of the Tappi fundamental research committee, at the Institute.

The five-day program will open with a tour of the Institute. On the

How LATTICE BRAID* Teflon† Packing saves Newton Falls Paper Mill, Inc. $1,000 a year on one machine

*Registered Trademark. *Only* Garlock makes LATTICE BRAID rod and shaft packings.

Up to a few years ago, Newton Falls Paper Mill, Inc., Newton Falls, N.Y., used an ordinary flax packing on the agitator shaft of a bleach chest employing liquid chlorine as the bleaching agent. With this flax packing there was a constant leakage of stock and bleach liquor, so Newton Falls decided to try our LATTICE BRAID Teflon Packing. The customer now reports that Garlock LATTICE BRAID: (1) *prevents* the loss of stock and bleach liquor, (2) has a *service life* of from 1½ to 2 years. This adds up to savings of $1,000 per year on *one* machine.

Put Garlock LATTICE BRAID Packing to work for your company. All the braided strands of this unique packing are lattice linked together into one structural unit. The strands hold together even when the packing is worn far beyond the limits of wear of ordinary braided packings.

LATTICE BRAID is made from flax, cotton, asbestos, wire-inserted asbestos, Teflon, and asbestos with Teflon impregnation—for various types of services.

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GARLOCK LATTICE BRAID PACKING

21st welcoming addresses will be given by the chairmen of the respective committees: K. C. Logan of Northeastern Paper Products Ltd. at Quebec, P. Q., and Mr. Lewis of the Institute. J. A. Van den Akker of the Institute will open the technical program with the paper, "Flow in Fiber Suspensions and the Effect of Turbulence." The second paper will be "Fiber Motions and Flocculation" by S. G. Mason of the Pulp and Paper Research Institute of Canada. He will be followed by W. van der Meer of Van Gelder Zonen N. V. in Velsen, Holland, who will discuss "The Hydrodynamics of the Headbox and Slice."

"Model Experiments of Sheet Formation on the Cylinder Wire" will be jointly presented by Börje Steenberg, Jan Bergström and R. I. Kjensjord, all of the Swedish Forest Products Research Laboratory in Stockholm. George Burkhard and Peter Wrist of Quebec North Shore Paper Co. in Baie Comeau, Que., will close the day's sessions with the paper, "The Evaluation of Paper Machine Stock Systems by Basis Weight Analysis."

All sessions will be followed by a discussion period.

International flavor

The meeting will maintain its international flavor with the presentation of papers by experts from the European industry.

Among the latter will be W. E. Bennett of the British Paper & Board Industry Research Association, who will discuss "Quantitative Studies of Water Removal by Table Rolls;" O. Andersson of the Swedish Forest Products Research Laboratory, "Influence of Differential Speeds Between Stock and Wire on Sheet Properties;" George F. Underhay of Bowaters Development & Research Ltd. in London, "Water Removal and Two-Sidedness;" Alfred H. Nissan of the University of Leeds in Leeds, England, "The Functions of the Felt in Water Removal on the Papermaking Machine;" Lars Nordman of the Central Laboratory of Finland in Helsingfors, "Laboratory Investigation of Water Removal by a Dynamic Suction Box;" Bertill Ivarsson of the Swedish Forest Products Research Laboratory, "Introduction of Strains into the Sheet on Drying," and H. F. Rance of the Wiggins Teape Group Research Organization in Bucks, England, "Effect of Water Removal on Sheet Properties."

Speakers representing the North American industry will include: Roy P. Whitney and William L. Ingmanson of the Institute, "Filtration Resistance of Pulp Slurries;" C. C. Porter of Southland Paper Mills Inc. of Lufkin, Texas, "Stroboscopic Observations of the Wet End;" Wilfred Galley of the E. B. Eddy Co. at Hull, Que., "Fiber Properties and Fiber-Water Relationships in Relation to the Strength and Rheology of Wet Webs;" D. J. MacLaurin and J. F. Whalen of the Institute, "The Effect of Wet Pressing on Sheet Properties;" Dalton L. Shinn of Crown Zellerbach Corp. in Camas, Wash., "Measurement of Draws and Machine Speed Variations," and Homer E. Malstrom of Kimberly-Clark Corp. at Neenah, Wis., and John P. Nash of the University of Illinois, "Elastic Theory of Nips with Practical Applications."

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Industry Represented on U. S. Chamber Committee

Two representatives of the pulp and paper industry have been named to the 1954-55 committee on natural resources of the Chamber of Commerce of the United States. Serving as committee chairman for the second consecutive year is Franklin E. McCaslin, president of Oregon Portland Cement Co. at Portland, Ore.

The 44-member committee has a balanced representation of the extractive natural resources industries and the related fields of energy supply, conservation and land utilization from all sections of the country.

Paper industry officials who are members of the Forest Products group are George D. Bearce, general manager for St. Regis Paper Co. at Bucksport, Maine, and E. C. Rettig, first assistant general manager of Potlatch Forests Inc. at Lewiston, Idaho.

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U. S. Paper and Paperboard Production

	May 1954 (tons)	Apr. 1954 (tons)	May 1953 (tons)	Total 1953* (1,000	Total 1948 tons)
Paper and Board, total	2,238,803	2,185,527	2,266,946	26,459	21,897
Paper, total	962,842	964,313	962,803	11,394	11,119
Newsprint	96,151	89,730	90,107	1,069	876
Groundwood paper (uncoated)	64,630	67,839	67,127	771	772
Printing and converting (coated)	102,148	103,164	96,968	1,182	809
Book paper (uncoated)	131,360	132,681	138,775	1,623	1,570
Fine paper (writing, cover and text, bristols, thin paper and other)	110,232	111,501	112,343	1,290	1,141
Coarse paper (unbleached kraft, glassine, greaseproof, vegetable parchment and other)	283,606	276,575	292,593	3,398	3,072
Special industrial paper (including absorbent)	44,821	43,138	45,953	553	415
Sanitary tissue stock	110,200	118,668	100,123	1,277	983
Tissue paper (except sanitary and thin paper)	19,694	21,017	18,814	231	205
Paperboard total	1,019,341	973,816	1,042,314	12,220	9,366
Container board, total	561,084	522,803	575,269	6,613	5,079
Liners	387,623	353,527	383,858	4,411	3,347
Corrugating material	147,715	144,431	161,057	1,906	1,376
Container chipboard	25,746	24,845	30,354	296	319
Bending board	302,842	296,174	296,972	3,566	2,153
Nonbending board	71,228	72,179	78,691	898	597
Special paperboard stock	77,300	75,661	85,205	1,071	1,568
Cardboard	6,887	6,999	6,177	72	87
Wet machine board, total	10,958	11,931	13,671	155	142
Construction paper and board, total	245,662	235,467	248,158	2,688	2,591
Construction paper	115,560	109,662	122,158	1,312	1,321
Hardboard and insulating board	130,102	125,805	126,000	1,376	1,270

(*) Preliminary report. Source: U. S. Department of Commerce.

News of the Industry . . .

Industry News Notes

National Container Corp. has transferred its Tomahawk, Wis. box plant operations to a new plant in Milwaukee. The firm will continue to operate its paper and paperboard mill in the northern Wisconsin community.

Sources close to the company have branded as untrue rumors that **Racquette River Paper Co.** of Potsdam, N. Y., is to be sold by the Sisson interests.

Commercial Alcohols Ltd. is now a wholly owned subsidiary of **Canadian International Paper Co.** The remaining oustanding shares of Commercial have been acquired in accordance with the offer made late last year and subsequently extended. Commercial makes alcohol, shellac, magnesia, insulating material, antifreeze, etc. Its main plant is located adjacent to the Gatineau, Que. mill of Canadian International.

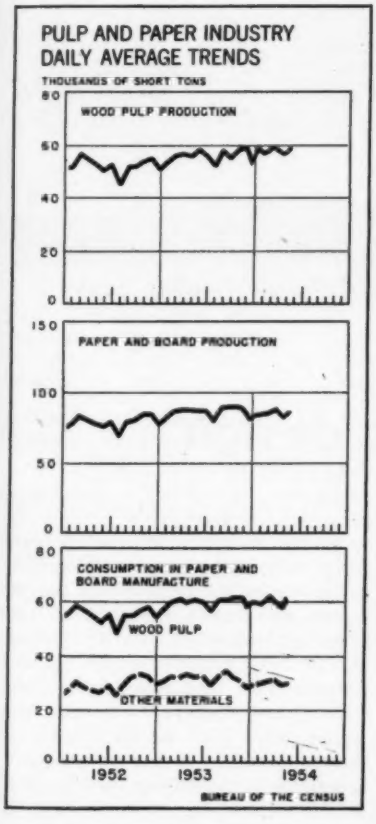
Crown Zellerbach of Canada Ltd. has purchased 235 acres of land in Vancouver, B. C., for the construction of a conversion plant. Production will include printed food wrappers, containers, bags and waxed papers.

Crown Zellerbach Corp. has filed a denial to Federal Trade Commission charges of violating Section 7 of the Clayton Act through its acquisition of the assets of St. Helens Pulp & Paper Co., St. Helens, Ore. While agreeing with many of the factual allegations contained in the complaint, the firm has flatly denied that the effect of the acquisition may be substantially to lessen competition or to tend to create a monopoly in the paper and paper products industry.

West German industrialists have offered to finance the construction of a cellulose plant in southern Chile. The plant is part of a project aimed at increasing the utilization of Chile's timber supplies by manufacturing wood pulp for newsprint production.

May Pulp, Paper and Board Production

Paper and board production during May amounted to 2,238,803 tons, according to a report released by the Bureau of the Census. This is a 1 per cent decrease from the 2,266,946 tons produced in May of 1953. Paper production, amounting to 962,842 tons, was approximately the same as the 962,803 tons produced in May a year ago. The output of paperboard grades during the month, amounting to 1,019,341 tons, reflected a slight decrease from the production of 1,042,314 tons reported during last May.

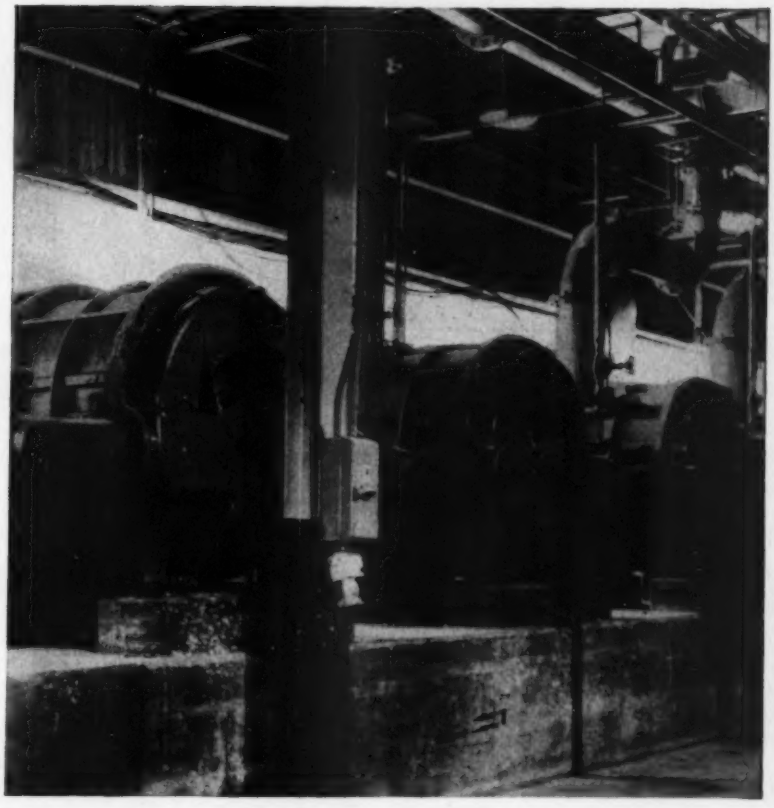


Pulpwood receipts at the pulp mills during May amounted to 2,035,064 cords, with consumption to 2,455,392 cords. Month-end inventories at 4,868,908 cords showed an 8 per cent decrease.

Wood pulp production during May amounted to 1,546,250 tons, as compared to the 1,513,372 tons produced in May of 1953.

Wood pulp inventories at the end of May at the paper and board mills amounted to 493,379 tons, showing a slight decrease during the month. Month-end stocks at the pulp mills amounted to 175,974 tons.

What, actually, do Vacuum Pumps on paper machines handle?



Paper mill engineers know that it is actually a mixture of air and water vapor, but the custom of rating vacuum pumps in terms of air capacity alone causes this important fact to be frequently overlooked.

The presence of this water vapor causes a considerable reduction of the effective air handling capacity of any vacuum pump except the Nash. In the Nash Vacuum Pump the bulk of this water vapor is effectively condensed, due to the Nash operating principle. The air handling capacity of the Nash is therefore not reduced.

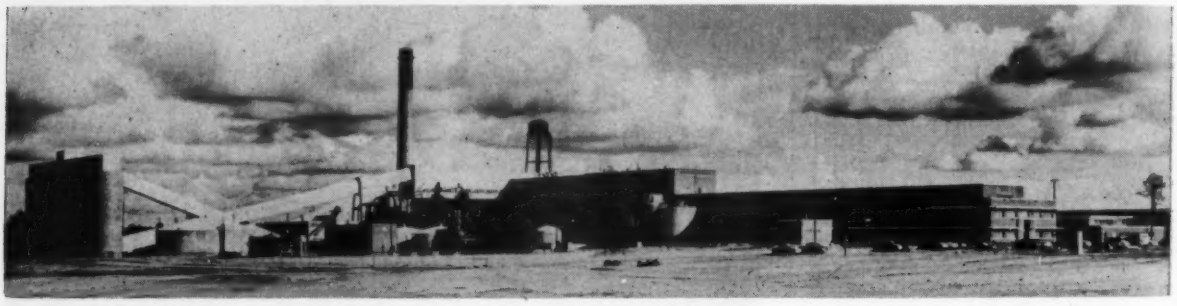
That is one of the reasons why Nash Vacuum Pumps are standard in over a thousand leading Paper Mills.

NASH ENGINEERING COMPANY

443 WILSON ROAD, SO. NORWALK, CONN.

Symbolic key for the $25,000,000 Jesup plant is accepted by William E. Breitenbach, vice president in charge of production; making the presentation is Russell F. Erickson, Rayonier vice president for engineering, who was in charge of construction; the key of southern pine represents the raw material for the Jesup operation

Enjoying the Georgia-style barbecue after the dedication ceremonies are (l to r) A. G. (Sandy) McArthur, manager of Rayonier's southeast timber division; William E. Breitenbach, vice president for production; J. A. Leaphart, mayor of Jesup, and Thomas R. Stein, resident manager of the new chemical cellulose plant



Rayonier scores with new plant design

RAYONIER INC. recently put into operation the world's most modern and best integrated chemical cellulose plant. Designed by Rayonier engineers, the Jesup, Ga. operation utilizes a significant new process developed by the company's research division.

Woodyard operations

The new plant will consume approximately 200,000 cords of wood per year. Pulpwood can be placed either into storage piles or directly into the flume for immediate use. Wood storage facilities are designed for a maximum inventory of 20,000 cords.

A Rayonier-designed truck unloader is an interesting feature of the new mill. This new installation permits trucks to back up to the flume, where the wood is rapidly unloaded directly into the raceway leading to the barkers. The advantage of this new equipment is that it permits very rapid handling of wood trucks.

A concrete flume more than 1000 ft. long carries wood from the storage area to the barking plant. Water for the flume is circulated by two 16,000-gpm pumps.

The flume is equipped with a water screen and flume-cleaning system, which removes all bark for burning in the bark boiler.

Wood coming down the flume can be routed either to the two barking drums or to the hydraulic barker. A continuous 18-in. hydraulic barker requires 1200 gpm of water at 1550 psi.

Wood from both the hydraulic barker and the two barking drums is inspected on a rubber sorting belt 72 in. wide and 120 ft. long. Reject wood is recycled to the barking drums, and clean wood is conveyed to the chipping plant. Large-diameter logs go to a special stationary axe-type splitter, which handles pulpwood up to 36 in. in diameter, reducing it to required size for the two 110-in. 10-knife chippers.

Chip storage facilities consist of six Semtile 30- by 80-ft. circular storage bins.

Vibrating feeders remove chips from the bins for their delivery over weightometers to the digesters.

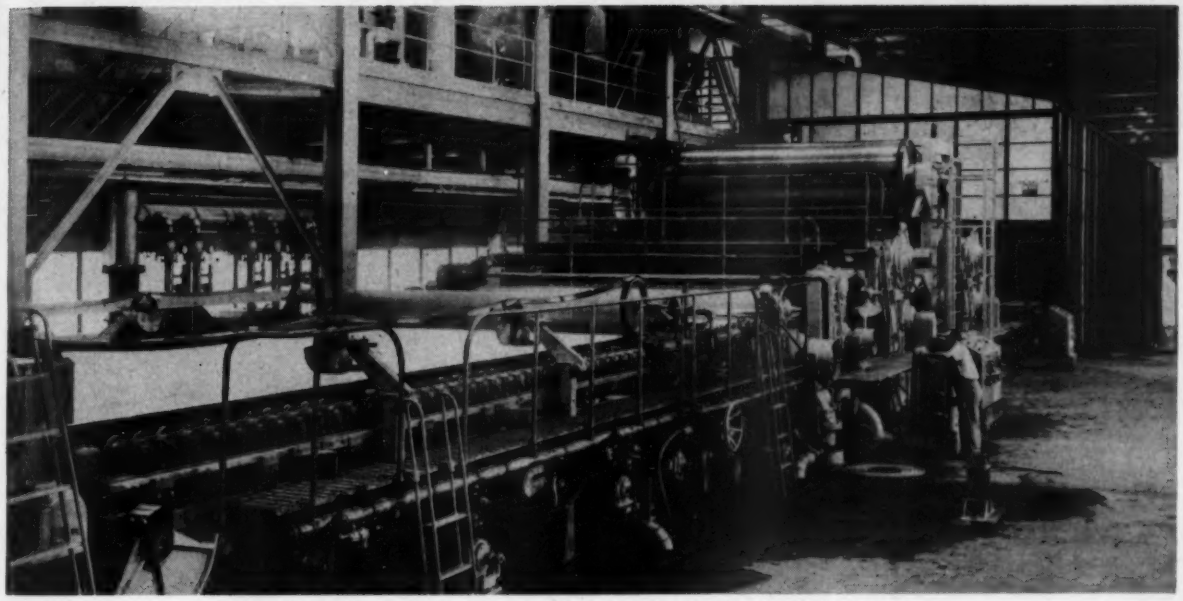
An interesting feature of the new Jesup mill is the use of a TV camera at the top of the chip storage bins to permit the operator at ground level to view the contents of each bin; this so that he can control the shuttle belt delivering chips into each of the bins.

Complete flexibility has been designed into the chip-handling and storage facilities to permit complete separation of the various wood species. It also allows chips to be blended in any proportion for loading digesters.

Digesters stainless steel lined

The digester house contains eight 12- by 55-ft. stainless steel lined digesters equipped with digester circulating systems and special stainless steel valves.

The pulp is blown from the digesters into a 26-ft. diameter blow tank from which the stock is pumped to the counter-current brown stock washing system consisting of three 9½- by 16-ft. washers. All vapors released during the blow period are recovered in a blow heat recovery system which provides hot water to the



All metal parts of the pulp machine wet end are clad with stainless steel

entire mill. High-density stock from the final washer passes to a large Semtile storage tank which holds the stock before it moves onto the screen. This tank provides ample reserve capacity to assure operating continuity as well as flexibility for changes in pulp grades.

Liquor recovery—many unusual features

Black liquor from the brown stock washers goes to the recovery system through a Waco filter. From large black liquor storage tanks the liquor then flows into sextuple effect evaporators, where it is concentrated to 50 per cent total solids. This passes through two wet-bottom-type Cottrell precipitators. Each precipitator is designed for a capacity of 110,000 cu. ft. of gases per minute. The primary purpose of these precipitators is the reclamation of valuable process chemicals from flue gases, but approximately 20 per cent excess capacity was provided to eliminate the carryover of solid particles into the atmosphere. This "over design" was intentional. Air pollution and odor problems are thus minimized.

It is a well known fact that the odor-producing compounds tend to cling to the surface of dust particles, which, if not eliminated, will contribute odors. By eliminating the very fine dust particles the volume of odor-producing components is minimized, and odors emanating from the mill are substantially reduced.

A unique feature of the caustizing layout is the elevated kiln which provides free discharge of burned lime into the primary slaker. This eliminates the usual troubles of conveying hot fresh lime.

The 180-ft. long lime kiln has a capacity of 100 tons per day. It is equipped with a Rotoclone which reclaims lime dust and prevents dust contamination in critical operating areas.

Rayonier engineers have gone to great lengths in both the plant layout and equipment selection to ensure that the chemical cellulose produced at the new plant will be of the highest quality. One example of this is the special filtering equipment to eliminate undissolved solids in the cooking liquor.

Another interesting feature of the new recovery plant is a special soap skimming arrangement to eliminate excessive scale in the evaporators.

In addition to the two recovery boilers, the plant is equipped with a combination oil and bark boiler with a rated capacity of 135,000 lb. of steam per hour. This boiler will burn both bark and oil simultaneously to provide a wide range of flexibility to meet the steam requirements of the mill.

The boiler is of an unusual design in that it has a traveling grate for ash removal and utilizes a combination of suspension and pile burning for the most efficient burning of the bark.

Heavy No. 6 fuel oil is burned in the boiler as well as in the lime kiln. The oil is received in tank cars and stored in a 10,000-barrel storage tank, from which it is transported in steam-heated pipes to secondary, smaller storage tanks located at the lime kiln and at the boiler house.

Stock washing and refining

From the storage tank pulp passes through a special dilution system to six Vibrotor screens. Overflow stock then goes to secondary and tertiary flat screens. The screened unbleached pulp next passes through six 12-in. Dirtecs, which discharge directly into a 9½- by 14-ft. tile vat that serves as a rewasher.

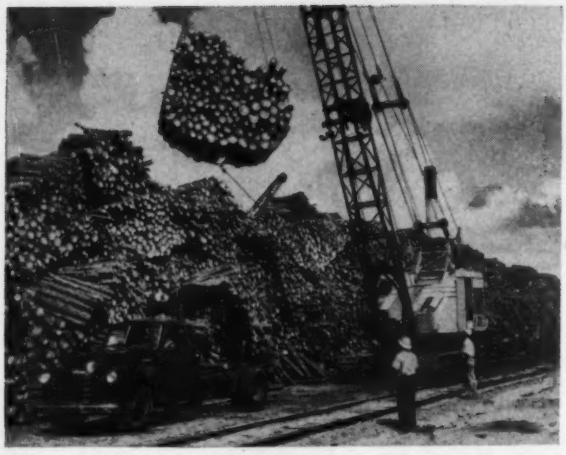
Washed pulp from the rewasher then goes through a consistency regulator into a 36-ft. diameter by 34-ft. high Semtile pulp blending tank. The stock tank serves both for storage and blending. A high rate of blending is obtained with three vertical agitators.

Washed and screened stock is then bleached in a multi-stage plant specially designed by Rayonier engineers. This is a significant development of Rayonier research for producing new high qualities of chemical cellulose. A graphic control panel controls the chlorine dioxide production in a Solvay system.

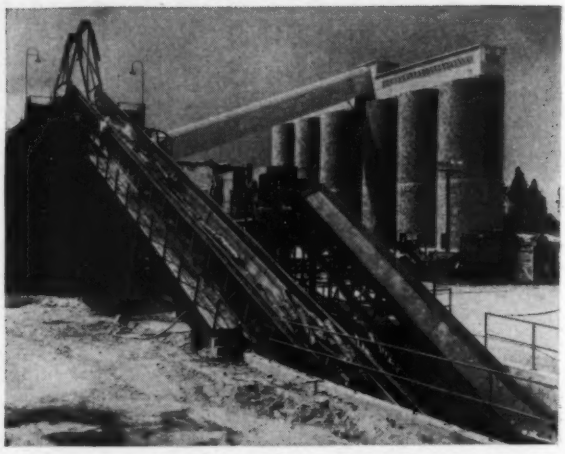
A second high-density storage tank receives the bleached stock. This bleached stock is then diluted with water through a special ratio-control system and pumped to three Vibrotor screens before going into the blending tank ahead of the pulp drying machine.

Pulp machine

The pulp machine has a number of unusual features specially adapted to serve Rayonier's exacting needs for controlling sheet formation. The headbox and slice arrangement uses an entirely new concept to eliminate fiber

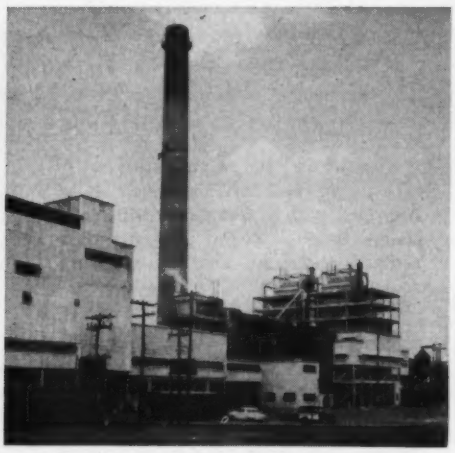


Wood yard operation is up-to-date in every respect with crawler cranes easing the materials handling problems

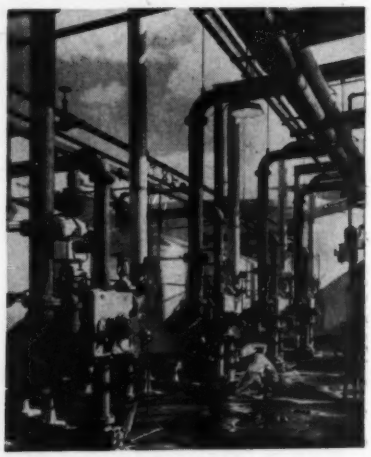


Log drags to two drum barkers (l) and hydraulic barker (r); chip silos are equipped with vibrating discharge pans

Distribution of chips to the six silos is monitored by television (camera not shown) so that operator can control shuttle belt from ground floor



Black liquor recovery boilers showing the unusual outdoor construction; installation is most extensive in North America



Water treatment equipment includes an accelerator and 11 softeners; however, much of the process water is used raw from four 1000-ft. wells

Dryer drums are stacked five high; sheet passes through cooling units before being wound

Sheeted pulp is carried to the two 1000-ton baling presses on automatic conveyor system

bundles, which result in poor sheet formation. The entire wet end was placed on a mezzanine floor to provide desirable operating features and to eliminate congestion at the operating level. The fourdrinier section is removable to facilitate rapid wire changing, and the entire machine is equipped with anti-friction bearings. All metal parts of the wet end are stainless steel clad, indicating the extent to which Rayonier went to insure high-quality production from the Jesup mill.

The fourdrinier wire is 175 in. wide and 95 ft. long. Three heavy-duty press sections, all hydraulically controlled, were provided with pre-dryers inserted between the second and third presses. Auxiliary motors drive the top press rolls. From the third press the sheet drops to the lower building level to enter the stack dryers, which consist of 10 stacks arranged for 94 dryers 48 in. diameter.

After passing through special sheet cooling units, the dried pulp sheet is wound on a two-drum reel into jumbo rolls weighing approximately 12 tons. A specially designed two-hook crane lifts the jumbo roll to an automatic transfer car, which transports the roll to a scale. After weighing, the roll is placed into either of two roll storage areas, with a combined capacity of 3000 tons of pulp, where the pulp is held until all chemical and physical tests are completed by the mill technical department.

Finishing operations

The modern finishing room is located at one end of a building which houses roll storage, finishing room and shipping operations, including indoor loading facilities for 12 railroad boxcars. Finishing room equipment includes a pulp cutter, an automatic conveyor system for handling finished bales, and two 1000-ton baling presses.

For roll shipments a separate finishing operation has been installed that includes a re-winder with wrapping and handling equipment. A fleet of electric fork lift trucks moves the finished rolls and bales into boxcars or storage.

Water supply

Water supply for the mill is provided by four 24-in. deep well pumps. Each well has a capacity of 6,000,000 gal. per day.

To assure high purity and uniformity of pulp Rayonier engineers, in cooperation with Infilco and Cochrane water specialists, designed special water treatment facilities which consist of an accelerator for chemical pre-treatment followed by 11 automatic water softeners.

Suppliers of equipment at Jesup

Woodyard operations

40-ton diesel-electric crane	American Locomotive Co.
¾ yd. diesel crawler	Harnischfeger Corp.
16,000 gmp flume pumps	Brigham Pump Co.
100 hp motors	Westinghouse Electric Corp.
Water screen	Link-Belt Co.
18-in. hydraulic barker	Hansel Engineering Co.
Splitter	D. J. Murray Mfg. Co.
10-knife chippers	D. J. Murray Mfg. Co.
Chip screens	Allis-Chalmers Mfg. Co.
Semtile storage bins	Stebbins Engineering & Mfg. Co.
Vibrating feeders	Jeffrey Mfg. Co.
Weightometers	Merrick Scale Mfg. Co.
Basic conveyor system	Jeffrey Mfg. Co.
Knife grinder	Hanchett Mfg. Co.

Digester operations, refining, recovery

Stainless steel lined digesters	A. O. Smith Corp. Chicago Bridge & Iron Co.
Blow heat recovery system	Fibre Making Processes Inc.
Semtile steel storage tank	Stebbins Engineering & Mfg. Co.
9½ by 16 ft. washers	Improved Machinery Inc.
Vibrotor screens	Bird Machine Co.
Flat screens	Improved Machinery Inc.
12-in Dirtecs	Bird Machine Co.
9½ by 14 ft. tile vat	Improved Machinery Inc.
Consistency regulator	DeZurik Shower Co.
Semtile pulp bleaching tank	Stebbins Engineering & Mfg. Co.
Vertical agitators	James Brinkley Co.
Chlorine dioxide plant	Solvay Process Div., Allied Chemical & Dye Corp.
Saran chlorinator lining	Stebbins Engineering & Mfg. Co.
Chlorine dioxide bleach towers	Stebbins Engineering & Mfg. Co.
Semtile washer vats	Stebbins Engineering & Mfg. Co.
Semtile hypochlorite bleach liquor tank	Stebbins Engineering & Mfg. Co.
Waco filter	Improved Machinery Inc.
Sextuple effect evaporator	General American Transportation Corp.
Wet bottom Cottrell precipitator	Research Corp.
Concrete stack	M. W. Kelly Co.
Cascade evaporators	D. J. Murray Mfg. Co.
Recovery boilers	Combustion Engineering Co.
Recausticizing system	Door Co.
Lime mud filter	Oliver United Filters Inc.
180 ft. lime kiln	Allis-Chalmers Mfg. Co.
Rotoclone	American Blower Co.
Special filtering equipment	Worthington Corp.
Oil & bark burning boiler	Babcock & Wilcox Co.

Pulp machine

Pulp machine	Rice Barton Corp.
Machine hood sets	J. O. Ross Engineering Corp.
Roll handling cranes	Ederer Co.
Overhead cranes	Northern Engineering Co.

Finishing room

Pulp cutter	Lamb-Grays Harbor Co.
Automatic conveyor system	Matthews Conveyor Co.
Baling presses	Washington Iron Works
Rewinder	Samuel M. Langston Co.
Wrapping & handling equipment	Lamb-Grays Harbor Co.
Fleet of fork lift trucks	Baker-Raskins Co.

Water system

Deep well pumps	Layne & Bowler Inc.
Accelerator for chemical pre-treatment	Infilco Inc.
Automatic water softeners	Cochrane Corp.

Construction

Construction & design of mill facilities	Ebasco Services Inc.
Erection & fabrication of stretched steel	Bristol Steel Co.
Building & equipment foundation	J. A. Jones Construction Co.
Erection of equipment	Eichberg Corp.
Installation of piping	Rowland Tompkins & Son
Electrical installation	Rollinson Engineering Co.

Air view of the new Valdosta, Ga. mill of National Container Corp.

At Valdosta, Georgia . . .

New National Container mill enters competitive production with a decisive advantage

This article features company employment and training methods, improved equipment design, and integration of operations — all of which make a special contribution to the mill's high level of productivity.

STREAMLINED AND INTEGRATED for maximum operating efficiency, economically constructed of corrugated transite, and featuring a high degree of instrumentation as well as many improvements in equipment

(Turn to page 480)

K. M. Guest
Plant Manager

J. C. Keegan
Personnel Manager

W. T. Carter Jr.
Safety Director

J. C. Booth
Office Manager

S. L. Binns
Purchasing Agent

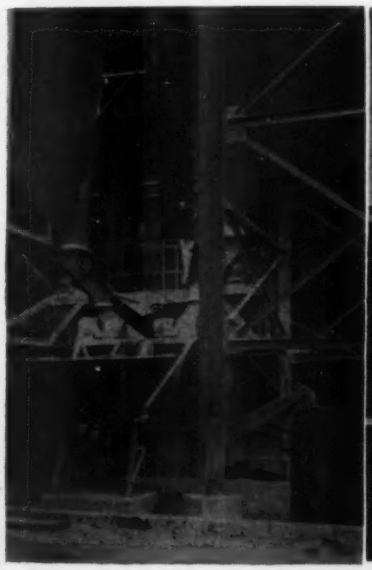
R. Joseph
Shipping Supervisor

Conveyor belt feeding directly into barking drums

Three chip silos supplied Valdosta by Jeffrey

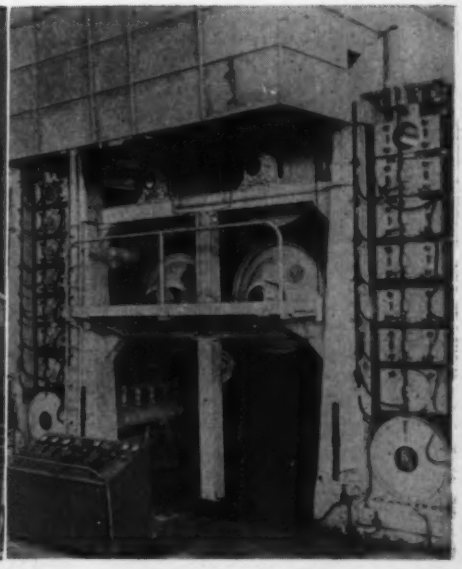
View of Goslin-Birmingham sextuple effect evaporators

Lime kilns and slakeners

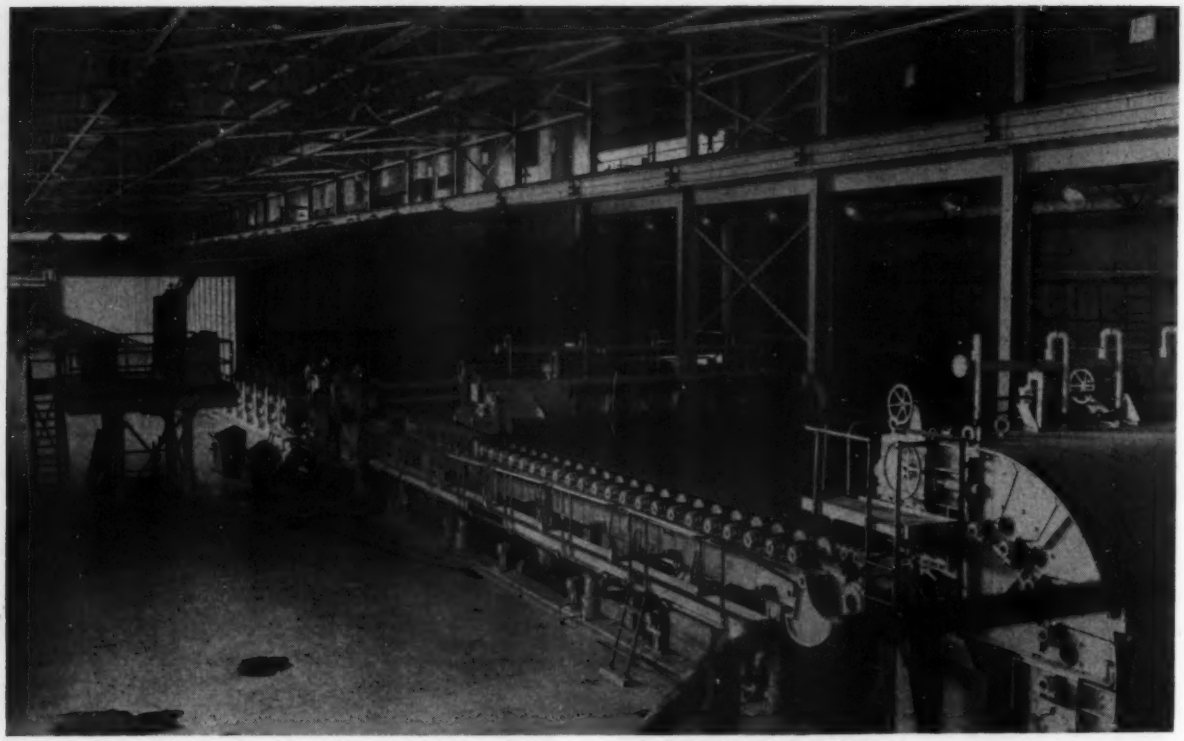


Bottom view of the slakeners that permit gravity flow to the clarifier

Dracco Corp. salt cake handling system as installed by National Container at Valdosta



Four drying rolls are located between two Bagley & Sewall calender stacks, with Ross hood over the dryer rolls



Bagley & Sewall 200-in. trim paper machine equipped with Valley Iron headboxes

design and operating procedures, National Container Corp.'s new Valdosta, Ga. mill has entered competitive production with a decisive advantage.

Fully realizing the important role of the supervisory and operating staff in an industrial enterprise, the company has put unusual care and effort into the selection of the mill's personnel. In 99 per cent of all cases, as reported by Personnel Manager J. C. Keegan, every department supervisor's approval was sought in the selection of each employee who came under his jurisdiction.

Once the selection of a new employee was made, he was subjected to an intensive training and testing program. First, he was indoctrinated on matters related to company policy. This was followed by operational training on dummy runs in the mill. The training was so thorough that each employee was required, at special meetings, to give a verbal account of how to start the mill in the correct sequence of steps. His attention was immediately drawn to any omission of steps or incorrect procedure of operations.

The training was not confined to the operating personnel. Everyone in a supervisory capacity had to undergo a six-weeks' training program, much of which consisted in doing dummy runs on the new mill's manufacturing facilities.

Woodyard operations

A 26-in. wide, 900-ft. long rubber belt is used for moving pulpwood directly to the barking drums. Pulpwood is fed to the conveyor belt through a loading hopper. The belt has a designed capacity of 1000 cords per day.

Barked pulpwood is discharged to two 6-ft. wide rubber belts supplying sorting tables, from where the accepted bolts are moved to two 10-knife chippers.

Other equipment in the woodyard includes two crawler tractor cranes equipped with grapples, a log splitter for splitting over-size logs, a bark hog, a weightometer, and a 150-in. knife grinder of the latest design.

Pulping

Five large digesters, each of 4500-cu. ft. capacity, are equipped for automatic and simultaneous charging of both liquors and complete pushbutton control of all digester operations.

Chips are conveyed from three 60,000-cu. ft. silos to the digesters via feeding tables, weightometer, and magnet (to remove tramp iron).

The liquor spouts are counter weighted and during liquor charges are automatically locked to the digester opening.

Another innovation on the digester is the audigage system for digester corrosion testing, which requires the presence of numerous plugs spaced around the outside of the digesters for easy access to the digester walls.

The location of the turpentine condenser next to the digesters presents a further unorthodox flow sheet design.

Stock washing and refining

A unique feature of the stock washing and refining system is the location of the high-density stock storage tanks (14 per cent consistency) below the washers and the deckers as follows: two 75-ton chests are below the washers, and a 125-ton storage tank is located below the deckers—so that a total of 275 tons of stock is immediately available to the machine.

The movement of stock from storage to the machine is via an agitator-type consistency control system and then, for final control, through a consistency regulator; thence through nine Sutherland refiners to the machine chest.

Provisions were incorporated at the Sutherland refiners which enable the operators to withdraw stock samples for quick freeness tests.

(Turn to page 482)

M. J. Farris
Pulp Mill Supt.

A. R. Varnado
Asst. Pulp Mill Supt.

J. E. Burnett
Asst. Pulp Mill Supt.

J. Gordon
Asst. Pulp Mill Supt.

J. T. Shankles
Asst. Pulp Mill Supt.

E. I. Wilson
Woodyard Sup.

W. C. Hayes
Paper Mill Supt.

H. Schmidt
Asst. Paper Supt.

W. A. Woods
Asst. Paper Supt.

A. E. Dennard
Asst. Paper Supt.

J. J. Jordan
Asst. Paper Supt.

J. E. Mailhos
Plant Engineer

E. R. Burr
Power Plant Supt.

M. L. Garmon
Asst. Power Supt.

E. B. Hewett
Asst. Power Supt.

D. W. Chism
Asst. Power Supt.

H. M. Geer
Asst. Power Supt.

F. A. Adams
Electrical Engineer

H. M. Burnette
Maintenance Supt.

W. J. Miles
Master Mechanic

J. W. Waltman
Asst. Master Mech.

H. A. Folsom
Labor Supervisor

D. M. Conant
Design Engineer

C. H. Nobles
Instrument Super.

E. S. Sheppard
Industrial Engineer

J. G. Copeland
Junior Ind. Engineer

B. Dozier
Chief Storekeeper

J. C. Clark
Technical Supt.

D. F. Carey
Technical Super.

H. C. Croom
Technical Super.

A new type control is located between the chest and the 30,000-gpm fan pump that delivers stock to the primary headbox.

The paper machine

The Bagley & Sewall cantilever-type paper machine can be operated at speeds of from 500 to 2000 fpm, trimming a sheet 220 in. wide. The machine features an electric variable speed 3500-hp electric motor drive, two pressure headboxes equipped with stainless steel manifolds, a new type DeZurik automatic level control system, a 54-in. diameter couch roll, two suction presses with 38-in. diameter rolls, a smoothing press, and a breaker stack.

The dryer section has 73 high-pressure 60-in. diameter dryer rolls arranged in four sections and operating at 125 psi pressure, 20 felt dryers, and a size press. Four dryer rolls are situated between two calender stacks.

Two top press rolls, the lump-breaker roll, the smoothing press roll, the size press roll, and the top breaker stack roll are rubber-covered.

The primary headbox delivers a quality of stock to provide about 80 per cent of fiber in the formed sheet, while the function of the secondary headbox is to deliver an additional 20 per cent of a finer stock at the suction boxes, thereby insuring the production of a smoother sheet.

The latest design in Ross hood and ventilation system handles 2,000,000 cfm of air in the supply and exhaust units. The machine hood, an open type, has twelve 72-in. Axiflo exhaust fans. The air supply units for the bottom felts have Silentvane fans and copper tube aluminum fin heaters, while two other units supplying the dryer section are equipped with centrifugal compressors and were specially designed for operation with new streamlined nozzles.

The winder, designed for speeds up to 5000 fpm, is equipped with a hydraulic table for receiving and lowering rolls to floor level. A hydraulic pusher automatically transfers the rolls from a conveyor to a lowerator.

Chemicals recovery

In accordance with the current trend to install shorter multiple kilns to provide for maximum flexibilty of operations, the company has two 170-ft. long kilns, and 8½ ft. by 9 ft. in diameter. They are fully controlled by a Bailey instrumentation system which makes this one of the most modern lime-burning installations. An oxygen analyzer indicates and records the oxygen content of the kiln gases; an electronic-type temperature recorder indicates and records lime kiln temperature and gas outlet temperature; an electronic-type flow meter records and indicates oil flow; and a draft controller indicates and records hood draft.

Hot burnt lime is conveyed directly to elevated lime slakers, thus saving heat otherwise lost in storage and permitting gravity flow of the slaked lime to the white liquor clarifier.

The spent liquor is evaporated in two sets of sextuple effect vacuum self-supporting evaporators equipped with 28-ft. tubes. Concentrated black liquor is burned in two 800-psi 800°F recovery boilers equipped with cascade evaporators.

Other equipment in the chemicals recovery operation includes two dry bottom electric precipitators and a salt cake-handling system. The latter—highly automatic—enables one man to unload sodium sulfate in bulk from boxcars into a 90-ft. storage tank at the rate of 15 tons per hour. The same system also withdraws, conveys over a distance of 175 ft., and discharges salt cake directly into process tanks.

Valdosta equipment suppliers and manufacturers

Steel fabrication and erection	Ingalls Steel Construction Co.
Building siding (transite and plastic)	Johns-Manville Corp.
Roofing	Standard Roofing Co.
Conveyors	Jervis B. Webb Co.
Conveyor belting	Goodyear Tire & Rubber Co.
Tanks	Chicago Bridge & Iron Co.
Refractories	United Refractory Construction Co. Laclede-Christy Co.
Insulation	Aber Co.
Electrical equipment	Westinghouse Electric Corp.
Pumps	Worthington Corp. Nash Engineering Co. Ingersoll-Rand Co.
Instrumentation	Bailey Meter Co. Minneapolis-Honeywell Regulator Co.
Crawler cranes	Northwest Engineering Co.
Barking drums	Carthage Machine Co.
Log splitter	Carthage Machine Co.
Chippers	Carthage Machine Co.
Chip silos	Jeffrey Mfg. Co.
Knife grinder	Hanchett Mfg. Co.
Digesters	Chicago Bridge & Iron Co.
Digester blow valves	Yarnall-Waring Co.
Refiners (washer system)	Hermann Mfg. Co.
Vacuum washers	Improved Machinery Inc.
Screens	Mantague Machine Co.
Rejects refiner	Sprout, Waldron & Co. Inc.
Valveless deckers	Improved Machinery Inc.
Screen valve and flow control	Trimbey Machine Works
Refiners (stock preparation)	Sutherland Refiner Corp.
Consistency regulators	DeZurik Shower Co.
Fourdrinier paper machine	Bagley & Sewall Co.
Pressure headboxes	Valley Iron Works Co.
75-in. winder	Bagley & Sewall Co.
Agitators	Improved Machinery Inc.
96-in. reel	Pusey & Jones Corp.
Automatic emulsifying size system	Hercules Powder Co.
Broke beater	The Black-Clawson Co.
Evaporators	Goslin-Birmingham Mfg. Co.
Causticizing system	The Dorr Co.
Sludge filters	Oliver United Filters Inc.
Lime kilns	Allis-Chalmers Mfg. Co.
Sulfate recovery boilers	Combustion Engineering Inc.
Electric precipitators	Research Corp.
Salt cake handling system	Dracco Corp.
Oil-fired power boiler	Combustion Engineering Inc.
Bark- and/or oil-fired power boiler	Combustion Engineering Inc.
Feed-water treating system	Worthington Corp.
Feed-water heater	Condenser Service & Engineering Co.
Deaerating heater	Hoppes Mfg. Co.
Cooling tower	Fluor Corp. Ltd.
Turbo-generators	Westinghouse Electric Corp.
Paper machine drive	Westinghouse Electric Corp.
Engineers and contractors	Merritt-Chapman & Scott Corp.

Shall it be a crane, a conveyor, or an industrial truck?

ARMAND T. GAUDREAU
Management Consultant
Gaudreau, Rimbach & Associates

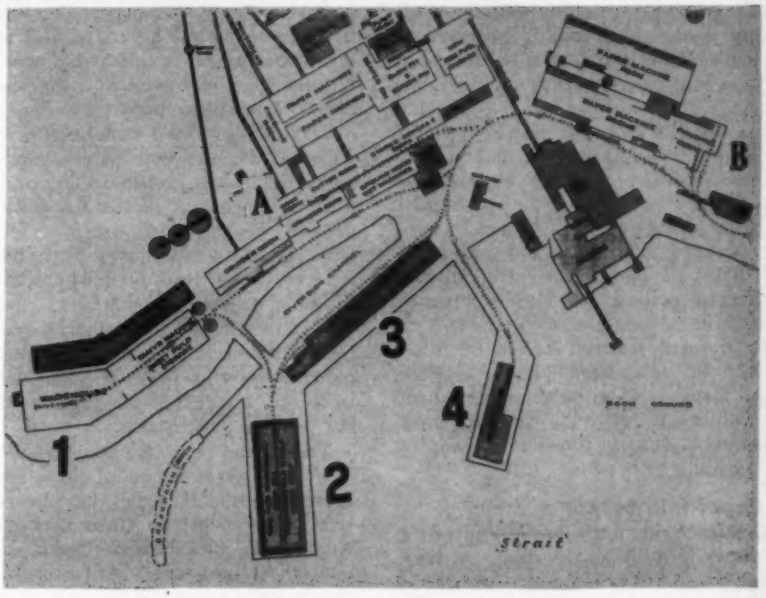


Fig. 1—Plan of the paper mill in which the study of newsprint handling was made

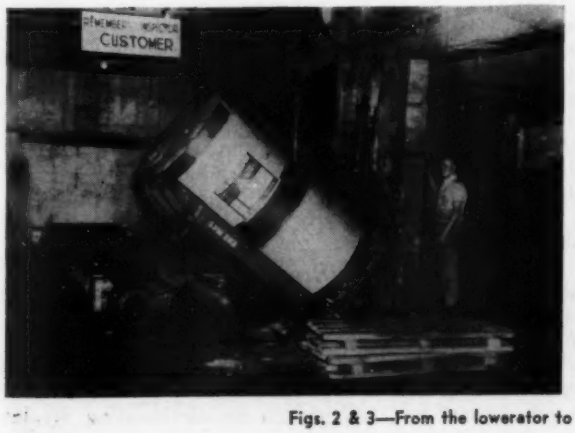
Part II—Proposed methods for handling the output of a paper mill. The preceding installment discussed the consideration of major factors in the selection of equipment.

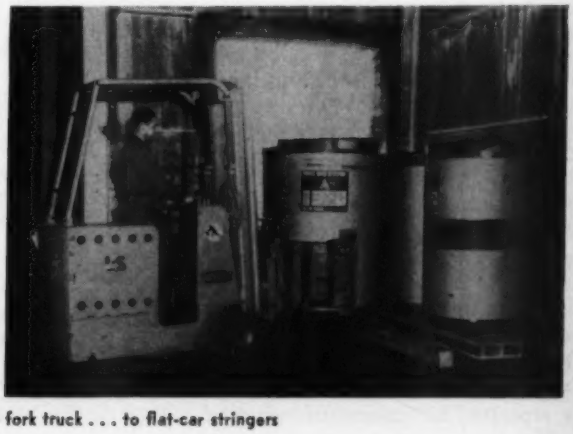
TO KEEP THE MATERIAL FLOWING through the papermaking cycle, the mill uses several distinct types of material movers. For example, logs are moved on conveyors; groundwood blocks travel by gravity chutes, conveyors and straddle trucks; newsprint rolls are handled at various points on powered conveyors, fork trucks, flat cars, dollies, cranes, ship's booms, industrial trucks, and highway trucks. Each type of material handling equipment used was chosen for its specific mechanical features coupled with economic advantages over competitive types of equipment.

The problem of selecting the most suitable type of material handling equipment for each of the various handling requirements has become increasingly complex in recent years for two reasons in particular. First, the variety of mechanical handling devices has grown to the point where there are now over 300 major types on the market, and many of them have overlapping applications. As for diversity within main groups of equipment, there are fully 50 distinct types of cranes alone, 90 different types of conveyors, and at least 40 separate types of industrial trucks. And the list is growing every year.

The second reason why the problem of selecting material handling equipment has become so complex is the broad range of handling operations which increasingly lend themselves to mechanization as new han-

Delivered in June 1954 before the semi-annual joint meeting of the American Society of Mechanical Engineers (N. Y.), the Association of Iron and Steel Engineers, and the American Material Handling Society.





Figs. 2 & 3—From the lowerator to the fork truck . . . to flat-car stringers

dling devices continue to appear on the market. A sound approach to the selection problem must therefore take into consideration not only the mechanical aspects of a particular handling device but also the entire economic appraisal of the various other devices that are likewise capable of performing the same handling operation.

Cranes, conveyors and industrial trucks all have their place in the overall pattern for handling material in a plant; and each type of equipment selected has to be fitted into an integrated plantwide flow of material so as to secure the most economical as well as the most smooth-working coordinated plan of handling operations.

Paper mill output

Newsprint rolls are produced in paper mills A and B (Fig. 1), both of which are situated on a hillside at a level which is 50 ft. higher than the water level where wharf sheds 1, 2, 3 and 4 are located. The output of either mill moves on flat cars of the plant railroad to all four wharf sheds for three shifts a day, while the shipping operations out of the wharf sheds are on a one-shift-a day basis.

The distance from the mills to the warehouses averages 3,850 ft. per round trip. This is equivalent to roughly three-quarters of a mile per round trip for any carrier transporting newsprint rolls from either mill to any of the four wharf sheds.

The combined output of the two mills is one roll a minute around the clock. The combined shipping activities out of the wharf sheds amount to six rolls a minute during the one shift a day that they are operated for loading ships.

There are no highways or outside railroads within 75 miles of the plant. All shipping is done by water. An analytical study of the physical and economic factors underlying the movement of rolls from mills to wharf sheds reveals significant potential savings by substituting an inter-building overhead chain conveyor for the plant railroad. In this particular case the choice lay between a plant railroad and a conveyor system. This conveyor system would pay for itself within two years. It would deliver the output from the two mills to a central overhead merry-go-round tower on a round-the-clock basis. From there the conveyor would transfer the flow to any one of the wharf sheds over a separated but connected conveyor circuit to each building. The entire system would be controlled by one man per shift operating push-buttons in the tower housing the conveyor merry-go-round.

Fig. 2 shows the complete path followed by the roll in its travel from the lowerator cradle seen under the canvas curtain in the left background to the fork truck. The truck itself is not shown here, but it is normally positioned where the tilt-table operator is standing.

The first point of travel is over the small wooden bench on the floor. Benches such as these will be seen in large quantities on layouts to be projected presently.

The second point is onto the four-wheel dolly in front of it. The loaded dolly can either be pushed away to the left to store the roll temporarily on another bench, or left where it is seen here to function as a cross-over for the roll on its way to the tilt table shown in an inclined position. It will be noted that an empty pallet was previously inserted over the forks of the tilt table.

Two rolls are cradled into the undulated steel sheet forming the bed of the tilt table. By pressing a push button on the wall, the operator causes the tilt table to upend the two rolls and seat them firmly onto the pallet. A fork truck then picks up the pallet load directly from the lift table and transports it to a flat car. The car bed is at the same level as the floor shown here.

Under the proposed plan, each roll would be picked up on its bilge by an electric clamp truck directly from the dolly, upended in transit, and deposited on the flat car. This would eliminate both the pallet and the tilt table.

Another plan would be to let the proposed inter-building overhead conveyor travel past the scale and pick up the roll from that location. This would dispense not only with the truck and the flat car, but would also eliminate the present need of dollies, pallets, tilt tables, and air hoists in the finishing room. It would also eliminate tilt-table operators, truck operators, and train crews by combining the entire handling operation with the functions of the scaleman.

The newsprint rolls from Nos. 7 and 8 paper machines are stored temporarily on their bilge on the benches. These rolls enter the finishing room by the lowerator. They go into a wrapping machine and are conveyorized to the storage benches until released to the capping machine located in the very center of the plan.

The rolls from Nos. 5 and 6 paper machines enter the finishing room and are conveyorized to the storage benches until released to the same capping machine in the center of the room. As the rolls come out of the capping machine, they pass across a scale and are then tripped onto wheeled dollies which are moved back and forth at right angles to the shipping storage benches. An electric clamp truck then picks up one roll at a time off these benches, upends the roll, transports it to the flat cars, and deposits it on one of the cars. The proposed inter-building overhead conveyor system would pick up each roll at the scale and do away with the shipping benches, clamp trucks and flat cars used here.

Fig. 3 shows the proposed electric clamp truck depositing an upended roll in nested position of flat-car stringers. The bed of the flat car shown in the lower right corner is flush with the level of the shipping platform in the finishing room. The two parallel rows of rolls placed on a flat car leave an overhang of 6 in. beyond the two long sides of the car. The wooden pallets now in use for transporting rolls are 8 in. high and thus provide an 8-in. vertical clearance for the roll overhang riding over the edge of the shipping platform.

By discontinuing the pallets, the roll overhang would rub along the surface of a 6-in. strip along the surface of the platform. In order to provide adequate clearance above the dock for this 6-in. overhang from the rolls jutting out of the car bed, three movable stringers have been placed along the surface of the car bed. These stringers permit the clamp truck to board the car, deposit its roll on the stringers, and return to the shipping platform without having to negotiate ramps to the raised level set up by the car stringers.

The proposed inter-building conveyor would, of course, dispense with all the equipment and labor used here, namely, the clamp truck and its operator, the car stringers, and the flat cars. Only the roll itself would remain.

Marine warehouse shipments

Fig. 4 shows the floor plan of one of the four wharf sheds at the paper mill, a car track running lengthwise of the building divides

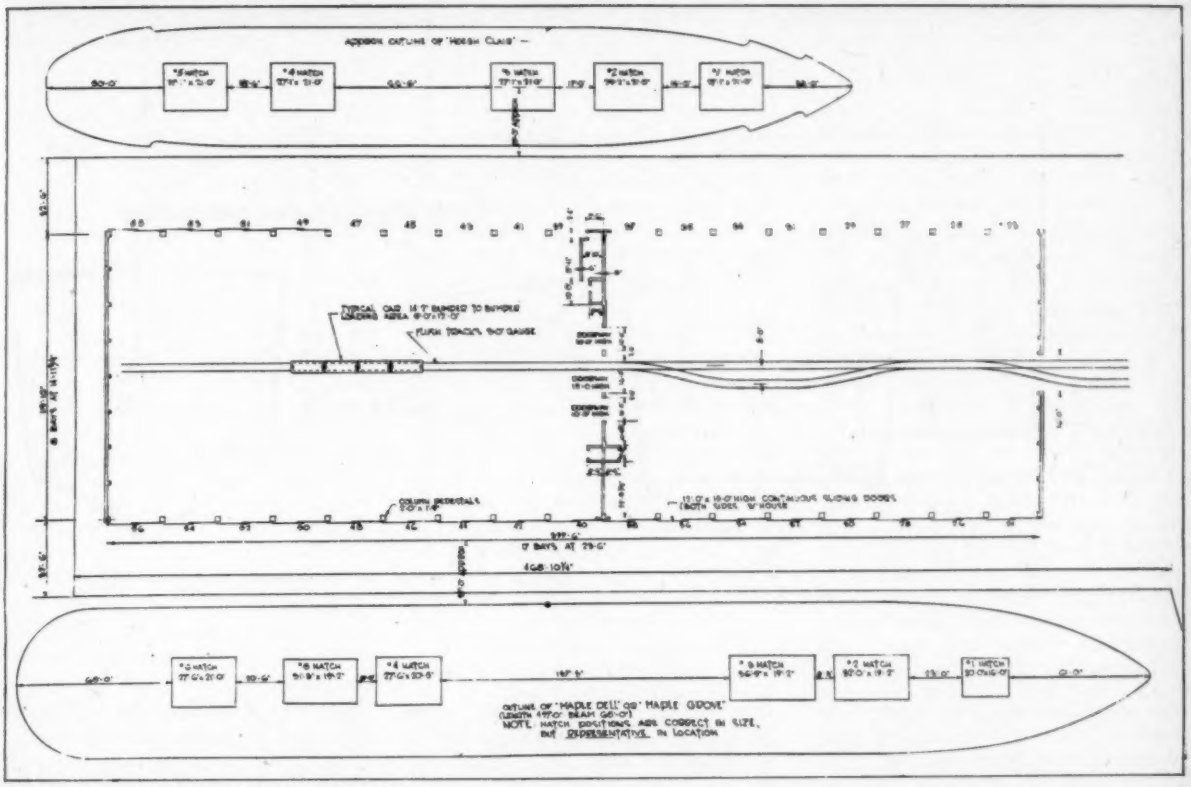


Fig. 4—Floor plan of one of the four wharf sheds

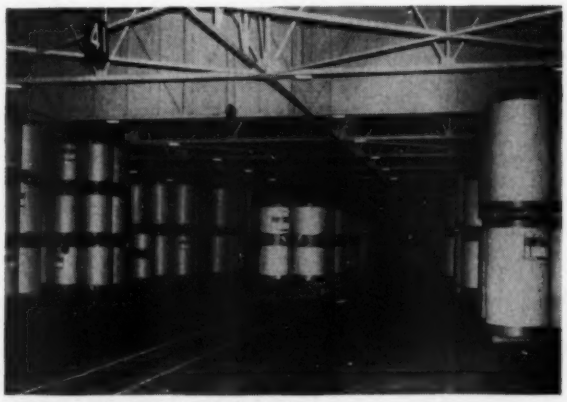


Fig. 5—Central aisle in No. 2 shed

Fig. 6—Existing and proposed roll storage

Fig. 7—One of the two ships calling weekly to load 3,000 tons newsprint

Fig. 8—From the hatch square to ship's hold

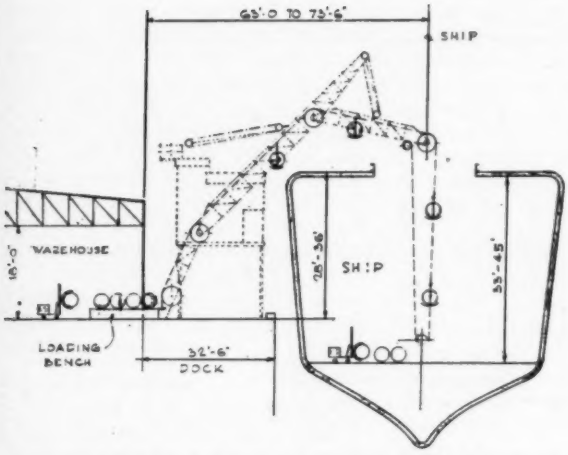


Fig. 9—Only three sets of ship's booms are used to load the cargo.

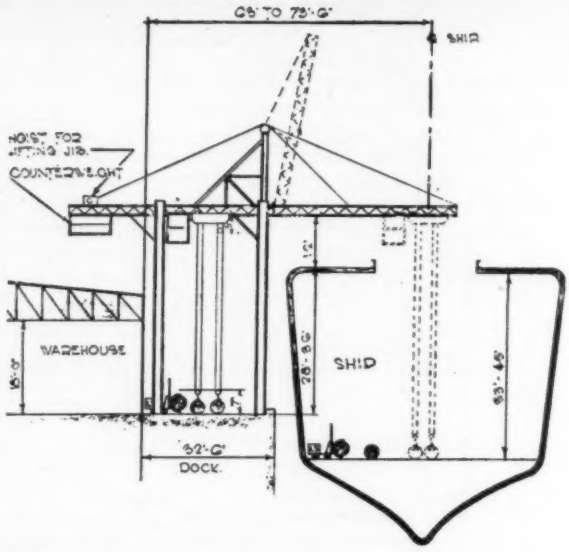


Fig. 10—A proposed tower conveyor for ship loading to reduce cost of loading operations by $100,000 annually.

the warehouse into two sides. The original plans of the building were designed to accommodate one entire ship's cargo of newsprint rolls on each side of the track. As matters turned out, however, unexpected losses of floor space cut this capacity down to about 75 per cent of expectations.

The vessels loaded from this wharf shed are all of the deepsea category. The one shown along the upper edge of the slide holds 4,600 newsprint rolls and represents 82 per cent of the type of vessels loaded at this wharf.

Under the proposed plan of replacing the company railroad with an inter-building overhead conveyor, the conveyor would run through the building over the present car-track area, and loop back along a parallel path alongside the incoming flow. The conveyor would deposit its rolls at controlled points along the conveyor path. Clamp trucks would then pick up the rolls at these points, transport them to pre-selected storage spots on this floor, and tier them three high to await ship-loading operations.

Fig. 5 shows a view of the central aisle in No. 2 wharf shed. Along this aisle which runs through the entire length of the 400-ft. shed is a car track which is flush with the warehouse floor. The elevation from the top of the tracks to the level of the car bed is 18 in.

Flanking both sides of this track is a truck aisle which is 12 ft. in width thus leaving an open traffic strip 30 ft. wide along the entire 400-ft. length of this shed. The cars on this track can only be unloaded one-half of their width from one side of the track, and the other half from the other side.

The trains along this 400-ft. length of track are spotted as much as possible near the storage space where the rolls are to be stored. Because of the mixed variety of roll sizes and customer labels in a carload of rolls, however, cars are frequently switched back and forth inside the shed by a gas tractor or industrial truck so as to position the load near the storage areas assigned to it.

Fig. 6 shows layouts of existing and proposed roll storage. The panel on the left shows the existing pattern of stocking two-roll pallet loads of newsprint rolls in the wharf shed servicing deepsea vessels. It will be noted that the bays can accommodate only three pallet loads of two rolls each within bay columns. Accumulated for the entire 400-ft. length of this shed, these unoccupied floor strips in front of each column, plus the floor space lost by having to leave 1 ft. of space between each pallet stack to allow for maneuvering, represent a loss of floor area equivalent to one linear foot out of every 7 ft. of building length.

Under the proposed plan shown in the right section the rolls would be stored singly and nested solidly against each other. This arrangement would permit the utilization of every available inch of storage area. The proposed electric clamp truck would also open up room for a third tier over the present two tiers of storage. The proposed layout would thus increase the present storage capacity of this warehouse by 87 per cent. This increased capacity would permit shipments to be stored closely to their destined hatch location aboard ship and thereby greatly reduce the average length of travel trips from storage to ship's side.

By nesting the rolls three tiers high enough additional cubic space is utilized for storage to increase the storage capacity of the wharf shed by 87 per cent as already pointed out. In so doing, more rolls can be stored near the doors leading to the ship's hatch into which the rolls will be stored, and consequently much of the present travel distance of the trucks would be reduced when the rolls are shipped out.

Loading deepsea vessels

In Fig. 7 the ship is representative of two deepsea vessels which call regularly, one ship a week, for a 3,000-ton cargo of newsprint rolls at the mill. The boats ply back and forth between the mill and the seaports, where the cargoes are offloaded into marine terminals for transshipment by boxcars to various newspaper plants throughout the country.

Four hatches are loaded simultaneously on each boat, as may be seen

in this picture from the number of extended ship's booms. A pallet load of two rolls is pre-positioned by truck on the dock apron directly opposite each hatch square. Two sling men slip a hawser sling around the two rolls, and the two winches on the top side near the hatch lift, swing, and lower the load as directed by a signalman at each hatch. The empty pallet is removed from the dock loading spot and stacked near the ship's side as seen here.

The lift over the ship's side varies from a rise of 28 ft. to a drop of 6.5 ft., and the vertical drop into the ship's hold starts with a maximum of 33 ft. The wharf shed is shown at the left with its continuous series of sliding doors permitting direct truck access to warehouse storage from any point along the dock apron.

The main handling operation in Fig. 8 consists of hand-trucking newsprint rolls from the hatch square to the storage in the hold. The boom sling seen in the upper left corner has been disengaged from the rolls and is on its way to the topside for another load. In the meantime, the two hand trucks (each with one roll being pushed by two or more men) are being maneuvered by their respective operators to transport the rolls into cargo storage. The eighth man shown here is the hatch foreman.

Under the proposed plan this picture would show just one man, namely the powered clamp-truck operator, upending a roll as he transports it to the storage spot and then raising it onto a second or third tier whenever the lower tiers are already occupied by preceding rolls on a particular storage spot.

In the newer types of deepsea vessels to be loaded at the rate of one ship per week at this mill (Fig. 9) only three sets of ship's booms are used to load cargo into the ship's holds, of which there are likewise only three in number. It will be observed, however, that there are six hatch squares opening into the three holds in the ship, the plan being to assign two hatch squares to each set of ship's booms.

Since in none of the three holds is there a bulkhead to separate the incoming cargo from two hatch squares per hold, only one hatch square is sufficient to service each hold if proper overside loading equipment is used instead of the ship's booms. This equipment could consist of a mechanical handling device capable of loading rolls aboard the ship in a continuous stream, such as is used for conveying materials on a horizontal level in mass-production plants. Or it could consist of a jib crane for each hold, the crane being equipped with a traveling cab which would guide and escort each roll from the dockside, then over the ship's side and finally down into the ship's hold. Both of these possibilities will now be explored.

Fig. 10 shows a proposed tower conveyor for ship loading. In this paper mill the total existing labor costs of shiploading crews amounted to $210,000 a year. The introduction of electric clamp trucks in the wharf sheds for transporting the rolls to the ship's side at four hatch openings at a time, as well as the use made of these trucks down inside the four holds for stowing cargo, indicated a combined saving of $70,000 in existing labor cost per year.

By mechanizing overside operations to replace the lifting and lowering of sling loads of rolls by the ship's booms, a further reduction of $100,000 a year was indicated for the deepsea ship loading operations. This additional saving of course takes into account the effect of reducing the turn-around time of loading a ship from the present loading period of 20 hours extending over a two-day stretch to a span of but 10 hours of loading which could be completed in one day's time by the portable tower conveyor shown here.

This continuous conveyor could feed the rolls directly from the dock and carry them over the ship's side and into the bottom of the hold. Electric clamp trucks would feed the conveyor on the dock apron, and similar trucks operating in the ship's holds would stow the rolls as they were delivered in the continuous conveyor flow. A device of this type would be needed for each of the three holds to be loaded simultaneously.

An installation of this kind would cost about $100,000 per ship's hold, or $300,000 for the three holds in the new type deepsea vessels. With a projected annual savings of $100,000 in shiploading operations performed by means of these conveyors, the total investment cost of this project would pay for itself in three years' time out of tangible savings alone.

The proposed hinged jib crane for shiploading involves heavy cantilever crane apparatus which is primarily a bridge or structural job not within the scope of equipment manufacturing except for the propelling mechanism and trolley hoists. The heavy gantry required here would be mounted on crane trucks for moving the crane laterally along the dock. This device would be fitted with an electric hoist for lifting the jib arm up to about a vertical position to permit the vessel to approach and leave the dock.

The hoist would be equipped with two grabs so as to lift two newsprint rolls at a time. This hoist would be operated by drum-type controllers in the cab traveling along the jib arm. An installation of this type would cost about $50,000 per ship's hold as against $100,000 for the tower conveyor shown previously. The $100,000 conveyor, however, carries a continuous flow of rolls into the ship's hold, and cuts the turn-around time of the ship by 50 per cent. The over-all annual saving in this case is $33,000 per conveyor when three such units are used simultaneously for loading a ship. At this rate, the capital investment would pay for itself in three years' time and save the mill $100,000 a year thereafter as an addition to net profit.

By way of comparison, the $50,000 jib crane feeds the rolls intermittently into the ship's hold because the hoist clamps must be returned empty after each trip to pick up two more rolls. During the time of the empty trip, no rolls are being moved. The turn-around time of the ship would remain at its present span of 20 hours, and thus be twice as long as needed when the tower conveyors are used.

The over-all saving per year by using the jib crane is estimated at $12,000 per crane when three such units are used simultaneously as in the case of the tower conveyors. The total capital investment for three of these cranes would pay for itself in four years' time as against only three years for the conveyors. Furthermore, the three cranes would jointly save the mill $36,000 a year thereafter, whereas the three conveyors would yield a continuing saving of $100,000 a year after the entire investment has been amortized out of savings realized in only three years.

In view of these indicated results, shall it be a crane or a conveyor? In a portion of this particular application, the industrial truck seems to occupy an enviable position of unsurpassed advantages. In the remaining portion of the application, a selection must be made between a crane or a conveyor. Which shall it be?

Fig. 1—Cutting the frill; the axe head is inclined 45 degrees and cuts ½ to 1 in. into the wood

Fig. 2—Paint brush application of poison to the frill; operator is protected by rubberized gauntlet gloves

Fig. 3—Gravity feed of poison to the frill; experimental apparatus finds a measured volume of solution placed in a bottle; back pack tank is used in practice

The chemical barking of western species*

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EXPERIMENTS CONDUCTED in conjunction with the chemical barking project of the Canadian Pulp & Paper Association have shown that treatments with arsenic (60 per cent sodium arsenite) and ammate (75 per cent ammonium sulfanate) were highly successful in bark removal and wood-weight reduction on western hemlock. The response of Douglas fir to these chemicals, while favorable, was slower and less uniform.

In addition to the above chemicals, some 54 different chemicals and formulations were tested in the experiment. A number of these caused the death of the trees, but only the ammate and arsenic formulations caused a loosening of the bark of Douglas fir. Hemlock was chemically barked by various arsenic formulations: calcium, sodium and magnesium sulfamate; ammate; sodium monochloracetate; and Endothal S 3003.

Methods of application

The frill girdle with gravity application of the dendrioide from a tank was favored by operators, since this method of treatment required the minimum effort, was the fastest, allowed more poison to be applied, and presented little danger to the operator. The band girdle was difficult to cut where the terrain was rough, which also slowed down the paint brush application of the solution. The band girdle with ammate gave a faster kill than ammate on a frill when hemlocks were treated before or after July. This difference in rate of kill due to girdle type was not evident when arsenic was used on this species. Bark removal from band girdled hemlocks poisoned with arsenic was easier than from frilled trees. Girdle type made little difference in bark removal from ammate-treated hemlocks. The band girdle on Douglas fir gave faster kill and easier bark removal than did the frill. This applied to the use of either arsenic or ammate. Girdle type had no consistent effect on reduction of wood density in either Douglas fir or western hemlock.

The application of arsenic to felled hemlocks did not result in a loosening of bark. The bark of Douglas fir could be removed easily 11 months after felling, whether chemicals were applied at the felling time or not.

The chemical barking of hemlocks with arsenic applied to a frill was possible even though the trees were felled one month after treatment.

In no instance did the bark fall from standing hemlocks or Douglas firs which had not been chemically killed.

It was computed that the cost of labor to frill and poison a hemlock 16 in. d.b.h. was 8 cents, and the cost of cutting the band girdle and applying the solution by brush was 12 cents, assuming the rate of pay to be $1.20 per hour. This would mean about 16 and 24 cents a cord, respectively.

Time of treatment important

The minimum killing time (29 days), the earliest barking (60 days), and the greatest reduction in wood density (16 per cent), occurred in hemlocks treated in July with arsenic. Ammate killed hemlocks in a minimum of 50 days. Hemlocks poisoned in August and September barked with sap-peeling ease or better on or before September of the following year. Douglas firs were killed in a minimum of 55 days by ammate and in 75 days by arsenic. These trees did not bark with ease until 15 months after treatment.

Reduction of wood density of chemically treated trees was independent of treatment. The reduction, in pounds per cubic foot, was at a maximum in September of the year of treatment in the case of Douglas fir and in May of the year following treatment of hemlocks. Compared with the wood density of untreated trees felled at the time of testing, the reduction in July

*From a paper presented at the summer meeting of the Technical Section of the Canadian Pulp & Paper Association, held June 14-17 at Victoria, B. C.

Fig. 4—Use of the barking spade to cut the band girdle; the girdle was cut 12 to 18 in. in width

Fig. 5—Paint brush application to band girdle; the entire surface of the sapwood is covered; apparatus is available that supplies solution to the brush through tube

Fig. 6—Easy barking of western hemlock poisoned with arsenic; the bark was cut along the upper part of the log and was removed in large sheets; evident is the typical coloration of the wood surface of trees killed with arsenic; the color, however, does not penetrate into the wood

Fig. 7—Chemically barked western hemlock logs on a forest loading platform; nearly 70 per cent of the bark has fallen off, while the remainder was subsequently removed by a hydraulic barker at speeds three times normal and at water pressures of less than half of normal

of the year after treatment was about 17 per cent for hemlock and 20 per cent for Douglas fir.

Effect on insects and toredos

The only insects present in any number in the killed trees were Ambrosia beetles. The largest number of these insects was present in hemlock killed by arsenic. The nature of the poison did not influence their distribution in killed Douglas fir. Insecticides (Systox and benzene hexachloride) applied with arsenic or ammate were not effective in reducing the number of beetles in hemlock.

Preliminary tests suggested that when placed in the ocean, logs from arsenic and ammate treated trees were invaded by fewer toredos than were logs from untreated trees, for a period of at least 49 days.

Translocation of arsenic in the tree

Measurement of the entrance, movement and distribution of arsenic in hemlock and Douglas fir, using normal and radioactive arsenic, revealed immediate absorption and rise at the rate of about 4 ft. per hour in the first four hours. The arsenic rose through the outer ½ in. of sapwood and diffused into the bark. The amount of arsenic in the wood and bark decreased with height above the girdle and with distance from the cambium.

The properties of pulpwood ground from hemlocks treated with arsenic and ammate were found to equal those of pulpwood ground from the sapwood of untreated trees. The fiber of unwashed pulp from sapwood of arsenic-killed hemlocks contained less than one part of arsenic in 50,000,000 parts of fiber.

Kill, barking ease and wood weight could not be related to ecological factors measured. The trees, shrubs, grasses, ferns, mosses, lichens and fungi near poisoned trees were not visibly affected by the treatment given the trees. Response of the trees to treatment could not be related to crown size or distribution, or to the d.b.h., if this diameter were 10 in. or greater.

Paper fiber from micro-organisms

WILL MICRO-ORGANISMS grown in large vessels under controlled conditions provide the bulk of our future fiber requirements for papermaking? Will they replace the trees of our forests? Experiments conducted by Dr. Willis M. Van Horn at the Institute of Paper Chemistry in Appleton, Wis., show that this possibility is no idle dream.

A mold-like micro-organism, grown in a solution containing dextrose and other essential nutrients, yielded 4 lb. of a fibrous material in the course of 48 hours.

The fibrous material—consisting largely of protein—unfortunately has only half the length of the cellulose fibers obtained from hardwoods. However, there is no reason to assume that, with proper selection of micro-organisms and the application of genetic principles, a micro-organism cannot be developed that will produce a fiber of the required length and at a sufficiently high rate to put this operation on a competitive basis with conventional wood pulp production.

The amazing story of penicillin provides ample evidence of what can be achieved along the lines of yield increases and quality improvement of products derived from micro-organisms grown in vessels under controlled conditions.

Even if grown at an economic rate at the present fiber length, Dr. Van Horn feels that this fibrous material is quite suitable for use as an extender for regular wood pulp when blended in a 1:1 ratio. Actually, paper samples have been made in the Institute's laboratory containing 95 per cent of the new fibrous material.

The special advantage of deriving a suitable fiber from micro-organisms would be in the relative absence of waste materials and a greatly simplified paper stock preparation process.

High-yield sulfite pulping*

▶ Using a soluble base acid with very small amounts of free SO_2, a commercial batch digester run yielded 74 per cent of pulp of good color and higher-than-average strength. Soda ash and sulfur consumption per ton of pulp was 200 and 123 lbs. respectively.

▶ An instrument capable of measuring pH directly and continuously has been developed. It provides the first direct and continuous indication of what is going on inside a sulfite digester at high temperature and pressure conditions.

A. High-yield sulfite pulping with a soluble base

J. S. HART, R. K. STRAPP, and J. H. ROSS**

THE ADVANTAGE OF the soluble base, such as sodium or ammonium, in sulfite pulping is that the content of free SO_2 in the cooking acid can be reduced without fear of precipitating the base, and that a high cooking temperature can be used without resulting in decomposition of the cooking chemical.

The commercial batch digester tests were made at the Riverbend, Que. mill of Price Bros. & Co. Ltd. following a series of laboratory and semi-commercial scale runs. The Riverbend mill was ideally suited for such tests because a whole unit, consisting of an 8200-cu. ft. digester, blowpit, necessary screens, refining equipment, etc. had been isolated from the rest of the pulping system during the development of the Curlator.

In all cooks, the Va-Purge impregnation pre-treatment process was used, with two purges, each to a top pressure of approximately 10 psi.

On completion of the purging, acid was introduced by placing steam pressure, 40 psi, on the acid in the second digester, which was serving as a reservoir, and then opening the valve connecting it with the experimental digester. After impregnation, surplus gester.

After impregnation, surplus acid was withdrawn from the digester and returned to the reservoir. The impregnation acid had a concentration of total SO_2 of 5.03 per cent, combined SO_2 of 2.39 per cent, and a pH of 2.7 per cent.

After withdrawal of the surplus liquor the digester was heated with direct steam to bring the pressure to a maximum of 85 psi in 1 hour and 15 minutes; and maintained at this pressure for 30 minutes. The yield was 73.6 per cent of pulp with a lignin content of 20.6 per cent.

B. Direct measurement of pH at elevated temperature and pressure during sulfite pulping

O. INGRUBER**

SINCE pH IS ONE of the major factors governing the course of the pulping reaction, it follows that accurate control of pH is likely to produce a better quality pulp and at lower cost.

Such control has now become possible with the invention, design, construction, test, and use of a new device which permits a glass-electrode to measure pH rapidly, accurately, and continuously at temperatures up to at least 165° C. and at pressures up to at least 140 psi.

The preliminary work carried out with the device has confirmed earlier indirect conclusions that the acidity of the cooking liquor is reduced by increased temperature. The acidity of the cooking liquor is therefore much less than indicated by its pH value at room temperature.

*Summary of papers presented at the Victoria meeting of the C.P.P.A.

**The Pulp and Paper Research Institute, Montreal, Que.

Precipitation of sulfite waste liquor*

THEODOR N. KLEINERT

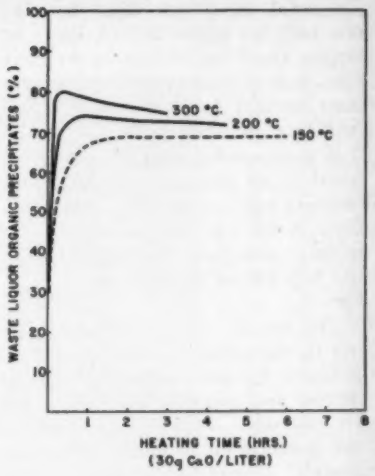
THE RECOVERY OF organic substances from sulfite waste liquor by precipitation seems to be the most promising method for the separation of these solids from the large quantity of water present in the liquors, and caustic lime obviously is the most economical agent for such precipitation.

The results of a series of experiments carried out with spruce sulfite liquor over a temperature range of 150-300°C. are shown in Fig. 1. As may be seen, nearly 80 per cent of the organic constituents are precipitated at 300°C. in about 20 minutes.

Table I shows the composition of the precipitate. An increase in the reaction temperature results in an increase of the ash content and a decrease of the organic fraction. Between 150-250°C., the amount of calcium sulfite (formed by the neutralization of sulfonic groups split off from the lignin sulfonic acids) increases with the temperature. At temperatures above 250°C., the calcium sulfite content decreases rapidly, due to the formation of appreciable quantities of sulfides through the reduction of sulfites by organic substances.

Table II shows the cleavage of methoxyl groups with increasing temperature. As may be seen, heating at temperatures above 200°C. results in a rapid cleavage of the ether links and therefore a decrease of the organic substances in the precipitate. These reactions at higher temperatures are the cause of the formation of phenolic degradation products of the lignin.

It is evident therefore that two different reactions take place during the alkaline precipitation of sulfite waste liquor:



(1) the splitting off of sulfonic groups, and (2) the combining of sulfide sulfur with the phenolic degradation products.

Further experiments have shown that the uptake of sulfide sulfur can be avoided by the addition of certain metallic salts; those of zinc and iron for instance, which form insoluble sulfides, thereby binding the sulfide sulfur before it can react with the phenolic degradation products.

*Condensed from a paper presented at the summer meeting of the Canadian Pulp & Paper Association. The results are based on work done by the author intermittently over a period of years at the Technical University of Vienna, Austria.

Table I—Composition of the precipitates

Temperature (°C.)	Ash %	$CaSO_3$ %	Organic Substance %	Methoxyl of Organic Substance %
150	39.9	13.3	60.1	15.4
200	43.2	18.3	56.8	14.7
250	46.1	25.5	53.9	9.1
300	46.9	11.7	53.1	2.5

Table II—Splitting off of methoxyl groups

Temperature (°C.)	Heating Time (Hours)	Methoxyl of the Ash-free Organic Substance %
150	6	15.1
200	3	14.6
250	2	9.1
300	0.5	2.3
350	0.5	0.7

Industrial management and human relations

G. W. E. NICHOLSON
Executive Vice President
Union Bag & Paper Corp.

TODAY WE ARE LIVING in a rapidly changing world, and here in America where industry plays such an important part we are witnessing daily changes not only in manufacturing processes but in management attitudes as well.

The progress in the past has been measured to a large extent by technical developments, and this will undoubtedly continue to be the case to a very great degree. There are, however, other territories that we in management must provide more attention than we have in the past. Much of our future progress will depend upon how well we have learned, and are willing to learn, to work together internally in our respective organizations. This is a phase of management that top executives must recognize and to which a great deal of time and consideration must be devoted. We cannot escape the fact that the human and social needs of any organization represent problems that must not only be handled delicately but efficiently.

In the past it was too often considered sufficient if a supervisor made decisions and issued orders with no consideration to the adverse effect that these would have on those under his supervision. This method of acting first and thinking later has become outmoded. The

Presented at the May 14, 1954, meeting of the Southeastern Section of Tappi at Savannah, Ga.

successful supervisor must be able not only to order but to lead; to inspire those under him to do their best, and to encourage them to use their mental faculties in the performance of their jobs.

A good yardstick of a supervisor's worth is his ability to properly educate and train his subordinates to do their work efficiently, and in instilling into them the desire to do the best job of which they are capable.

The human relation, job of creating in each man a sincere desire to perform his job to the best of his mental and physical abilities is not an easy one. It represents possibly the greatest undertaking facing industrial management today. This is particularly true in the case of large organizations where the individual employee plays only a minor yet extremely important part in the manufacture or development of a finished product.

The Importance of the foreman

Improved human relations in industry represent the surmounting of many problems, and they can be met by tying the employee in more closely with the company's plans and program and by giving the employee greater stature and more recognition. The accomplishment of this can only be brought about by a long-range, permanently organized, training program covering every member of management from the top down. The importance of the foremen in such a program cannot be over-emphasized. This means of course that foremen must first of all be chosen with a great deal of care. The fundamental qualifications essential at supervisory level, the minimum to be considered, are:

1. Health: In order to have sufficient energy to plan, to organize and to work.
2. Character: High moral qualities, firmness, reliability and integrity.
3. Intelligence: Common sense, judgment, common basic capacity to reason.
4. Personality: Leadership, tact, ability to get along with others, friendliness, ability to get things done.
5. Education: High school training or an equivalent in study.
6. Potentiality: Capacity for advancement.

The foremen must be constantly trained in company policies and techniques designed to keep morale and teamwork at a high level. His superiors, all the way up to the top, must also undergo training which is designed to bring about the very best morale and human relationships. All of this is aimed in the direction of company loyalty. Certainly it would be unreasonable to expect a foreman to be able to sell the idea to those who work with him that "his company is the best in the industry" unless he believes it himself. And it is just as unreasonable for top management to expect complete foreman-level loyalty unless it is proved to the foreman that his place in the scheme of things is important.

Management must take personal interest in every employee as a human being, and if special interest is closely and consistently demonstrated in daily contacts, in application and explanation of policy, individual coaching, action on grievances, etc., this phase of management's responsibilities will not only become effective but it will prove to be interesting because of its close alliance with the employee's personal goals or growth and achievement.

The employee in turn will feel that he is really a part of the team and that he himself plays an important personal role in the scheme of things. The development of pride of workmanship in the employee by according him proper recognition of his performance and skill should be the goal of every supervisor.

The foreman must understand and recognize the basic attitudes and sentiments which the employees themselves bring to their places of work. He must encourage opportunities for self-expression and freedom on the job by the individual workman. It is generally recognized that the good foreman has a personal feeling for his men and that he trusts his men. He approaches his work specifically rather than generally and talks about cases rather than principle in describing his problems and his approach to them. He has the courage to stand up for his belief.

Such foremen should be encouraged as they build good work relationships which lead to quality performance and company loyalty. The men in the ranks must be given an opportunity for self-development and recognition. The men should be led, not driven, and we should help them to do a good job, and when they do a good job they should be told so. When they are doing a job poorly, proper and full explanation should be given as to how it should have been done.

Fellow workers are greatest asset

Management can bring about an improvement of foreman-worker relationship by providing an atmosphere which recognizes the importance of human needs as well as the necessity for quality and output in the manufacturing process.

There are many avenues that are open to us in giving recognition to the employee as an individual, such as giving him information on new developments, and keeping him advised as to changes in his job or in the plant or the company. Those changes which will affect him as an individual are of prime importance to him. He should be encouraged to make suggestions which should be carefully considered, and he should be encouraged also to avail himself of those courses of study which the company or available schools might provide.

What is most important, he should be given an opportunity for promotion and self-development.

In general, a continuous intelligently planned program of man-to-man training should, in the years ahead, develop in the employee a greater respect for his job and bring about an increased interest and happiness in his work. Any such program of development dealing directly with the human equation in business should be supplemented with vocational and educational training programs. The vocational training should be basically for the purpose of giving the employee the opportunity to learn more about the technical aspects of his work. Employees also should be encouraged to further their education through the use of correspondence courses.

The awarding of college scholarships to qualified employees and sons of employees, while having no direct bearing on current human relations problems in industry, are bound to pay off in the future. It is by this means that many companies hope to develop men from within their own company families for many of the positions required in the management rank.

All of us are proud of the fine equipment in our plants. We like to break production records, and we strive constantly for improved quality and efficiency. This is as it should be. But we should be ever mindful of the fact that the people who work with us are our greatest asset, and that the most important function of management is the development of these people and not the direction of things.

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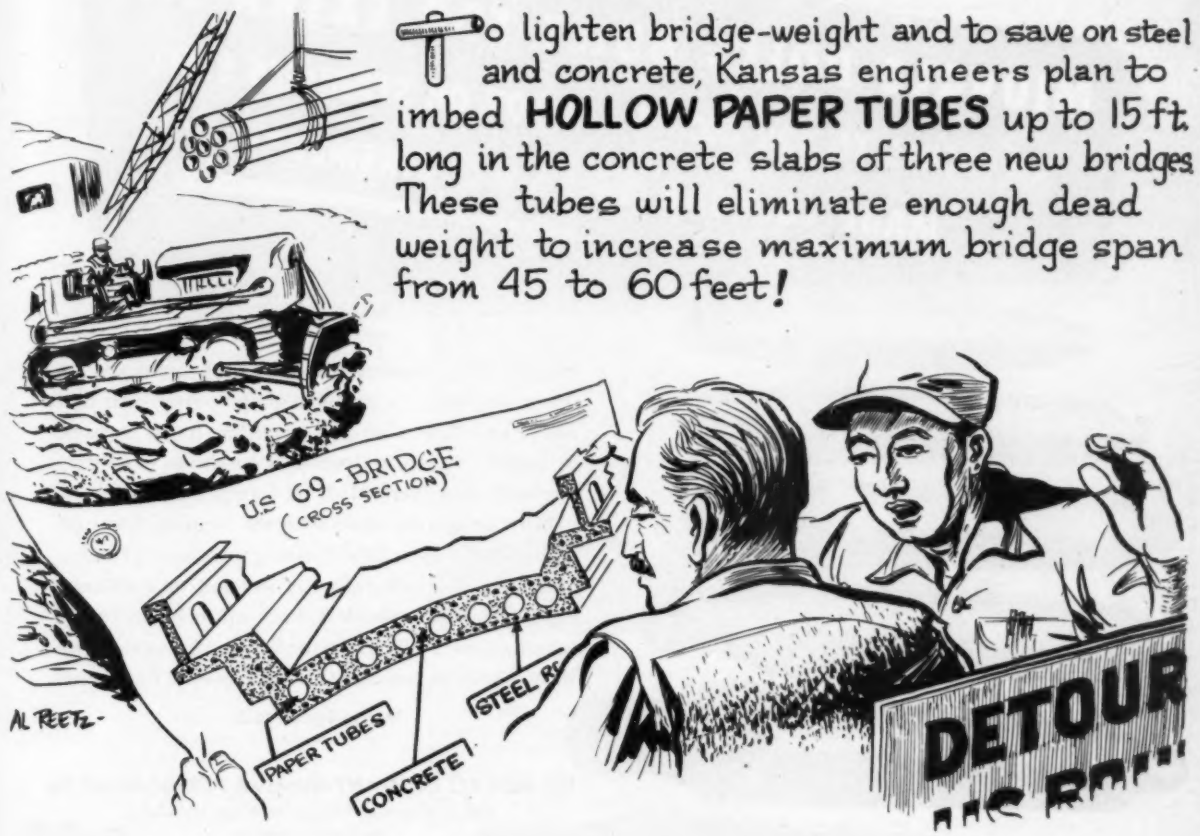

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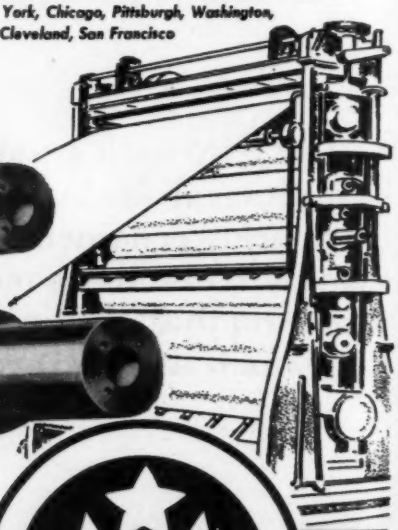

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ALLIED NEWS

Wickesberg Becomes Board Chairman of Appleton Woolen

A. H. Wickesberg has retired as general manager and treasurer of Appleton Woolen Mills, Appleton, Wis. A 50-year veteran with the firm, he has been named to the post of chairman of the board.

Succeeding Mr. Wickesberg as general manager is Harwood Orbison, son of the president of the company and grandson of one of its founders. Named to the treasurers' post was C. P. Heeter, office manager.

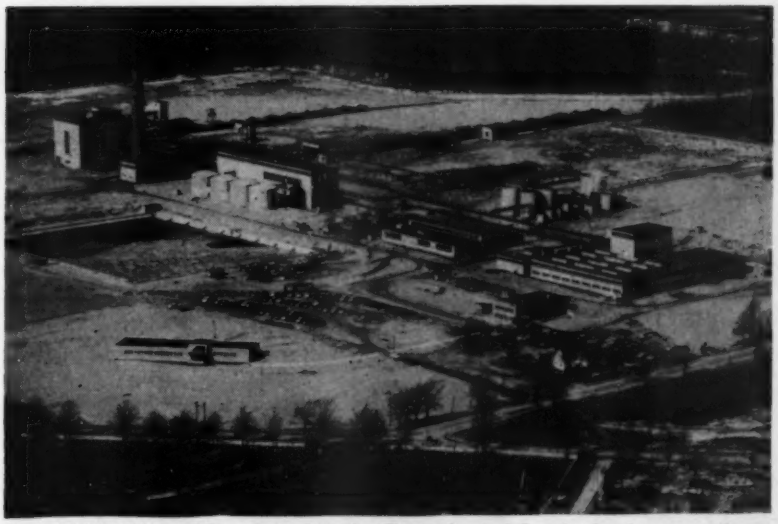
Mr. Wickesberg became associated with Appleton Woolen in 1902 as a clerk. He later traveled the upper Midwest for Lake Superior Knitting Works (subsequently Appleton Superior Knitting Works), returning to Appleton Woolen in 1907.

He was a director of Lake Superior Knitting from 1912 to 1933, when that firm was absorbed by Appleton Woolen. Mr. Wickesberg was named a director of the latter firm in 1911, treasurer in 1923 and general manager in 1940.

Prominent in the industry for many years, he served in many capacities in its trade associations. He was a member of the tariff committee of the National Association of Wool Manufacturers in 1940 and a director of that organization from 1944 to 1946.

Active in the National Association of Manufacturers, Mr. Wickesberg served on its industrial practices committee, tariff committee, industrial health and safety committee, and employee benefits committee.

He was a director of Northern Paper Mills from 1941 to 1953, at which time Northern was merged with Marathon Corp.



NEW MONTAGUE, MICH. plant of Hooker Electrochemical Co. that has been recently put into operation for the production of caustic soda, chlorine and hydrogen; the $12,000,000 facility comprises 125,000 sq. ft. of floor space and is located on 650 acres, 200 of which are set aside as a brine field; the plant, situated on the famous Salina salt formation of western Michigan, has daily capacities of 153 tons of caustic soda, 140 tons of chlorine and 1,422,000 cu. ft. of hydrogen

Allied News Notes

Arnold, Hoffman & Co. Inc. has dedicated its new multi-million dollar plant extension at Dighton, Mass. Visitors were shown some of the applications for the firm's dyestuffs and auxiliary products. . . . .**The Foxboro Co.** of Foxboro, Mass., has constructed a 15,000-sq. ft. plant in Pittsburgh that will double the present instrument assembly, service and repair facilities.

O. C. Cordes, vice president of **Downingtown Mfg. Co.**, and A. L. Bolton Jr., treasurer of the Emerson Mfg. Co. Div. of **John W. Bolton & Sons Inc.**, have announced that the two firms will collaborate on the sale of stock preparation equipment.

Stockholders of **Olin Industries Inc.** and **Mathieson Chemical Corp.** have voted to approve the merger of the two firms to form a new corporation, Olin Mathieson Chemical Corp. . . .**The DuBois Co.** of Cincinnati, manufacturer of industrial and institutional cleaning compounds, has annouced its entry into the paper mill cleaning maintenance field.

Wm. E. Hooper & Sons Co. is moving its executive offices from the Gilbert Building in Philadelphia to the 17th floor of that city's Liberty Trust Building at Broad and Arch streets. . . .**Albany Felt Co.** of Albany, N. Y., has installed a 650-in. loom said to be the largest ever built in the Western Hemisphere. The unit will produce the widest available felts for paper machines.

H. K. Porter Co. Inc. of Pittsburgh, Pa., has acquired Pioneer Rubber Mills Inc. of Pittsburg, Cal., largest manufacturer of industrial rubber products on the Pacific Coast. The new acquisition becomes part of Quaker Rubber Corp., one of H. K. Porter's nine divisions. . . . **J. O. Ross Engineering Corp.** is enlarging its department devoted to high-pressure hot water for industrial heating.

Establishment of **Kraft Equipment Co. Inc.** in Savannah, Ga., for the manufacture of pulp and paper mill machinery has been announced by L. M. Murray and Henry B. Mitchell, partners in the enterprise. The owners, who have leased a section of the old Kehoe Foundry building, explained that they plan to begin on a small scale with stress on equipment for agitation of pulp stock. The partners were formerly with Improved Machinery Inc. of Nashua, N. H. . . . **Louis Allis Co.** of Milwaukee has established a district sales office in Appleton, Wis. The branch will specialize in motor and drive equipment for the paper converting industry.

A new district sales office for the Tubular Products Division of the **Babcock & Wilcox Co.** has been established in Cincinnati. . . .**Conoflow Corp.** has formed a department to handle specialized engineering problems in the sale and application of Conoflow equipment. . . . **Beckman Instruments Inc.** of South Pasadena, Cal., produced its 100,000th instrument late in May.

Allied Chemical & Dye Corp. has announced completion of its new ammonia production facilities at its nitrogen plant in Omaha, Neb. Early completion of urea production facilities is expected. . . .**Worthington Corp.** has announced a new location for its Minneapolis office: 807 Thirteenth Ave., South.

Cuno Engineering Corp. of Meriden, Conn., has appointed James A. Plummer & Co. as exclusive representative for the Middle Atlantic states. . . . **Mississippi River Fuel Corp.** of St. Louis plans the construction of a $15,000,000 ammonia plant to produce anhydrous ammonia, nitric acid, and ammonium nitrate at a

Allied News . . .

daily rate of 200 tons . . . E. I. du Pont de Nemours & Co. has announced a schedule of price reductions for its Teflon tetraflyorothylene resin effective May 1.

Allied Personalities

R. A. Peterson, president of Valley Iron Works Co. of Appleton, Wis., has been named to the money and credit committee of the National Association of Manufacturers. . . .W. H. Pender has been named manager of belting sales for the Quaker Rubber Corp. division of H. K. Porter Co. He was formerly field engineer for conveyor and elevator belting.

Several executive promotions have been announced by the Black-Clawson Co.: Robert F. Vokes, general manager of the Dilts Machine Works Div., has been elected a Black-Clawson vice president; Frank T. Peterson, vice president and assistant to the president, has been named executive vice president and chairman of the new B-C executive policy committee; Don H. Montville, formerly assistant sales manager, has been appointed sales manager of the Shartle Bros. Machine Div. succeeding John A. Hamm, who will devote his activities almost exclusively to the promotion, engineering and sales of several highly specialized items of pulp and paper mill equipment; Robert R. Crawford of the Shartle Bros. Machine Div. has been named general manager of Black-Clawson International Ltd., B-C's British subsidiary.

R. F. Vokes

F. T. Peterson

D. H. Montville

J. A. Hamm

Sumner H. Williams has been elected vice president and general sales manager of the Dyestuff and Chemical Division of General Aniline & Film Corp. He had served in a similar capacity with General Dyestuff Corp., and his election as an official of GAF is coincident with the recent merger of the two firms. . . .A. Huntley Johnson has been appointed southern sales representative for John W. Bolton & Sons Inc.

Amos Good, formerly associated with Sandy Hill Iron & Brass Works, has been named Cameron Machine Co. sales representative in the Middle Atlantic states. . . .W. C. Willard, formerly staff assistant in the Memphis office, has been named manager of the Houston, Tex. branch of Corn Products Sales Co.

George Clayton

A. A. Nyitray

George Clayton, formerly head of engineering for Moore & White Co., has joined the sales staff of Wisconsin Wire Works of Appleton. He has been assigned the southern territory. . . .Albert A. Nyitray, formerly sales manager, has been elected vice president in charge of sales for Eastwood-Nealley Corp.

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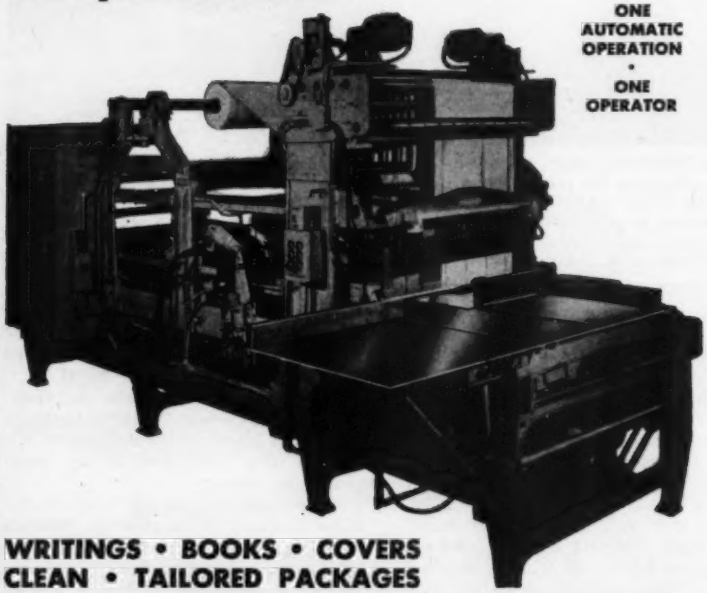

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J. E. M. Wilson, formerly vice president and manager of the mining division, has been elected vice president in charge of sales for Jeffrey Mfg. Co. . . . **N. J. Connor** is the new manager of the New York district office of the Babcock & Wilcox Co. Formerly assistant manager, he succeeds H. E. Martin, who has resigned.

Lewis McDonald, a 44-year veteran with the firm, has retired as vice president and assistant to the chairman of the board of Chicago Bridge & Iron Co. In other Chicago Bridge & Iron changes, **Fred L. Goldsby** becomes general sales manager, **George S. Trees** assistant general sales manager, and **Robert P. Davies** export manager.

Hooker Electrochemical Co. has announced the following changes: **Hiram B. Young,** formerly works manager for plants in New York, Ohio and Michigan, has been elected vice president in charge of eastern production; **Thomas E. Moffitt** formerly western manager at the Tacoma plant, has been elected vice president for western operations, and **F. Leonard Bryant,** formerly superintendent of the Niagara Falls, plant has been named works manager of the plant.

Hercules Powder Co. has named **John E. Biegner** district manager of its synthetic department's New York area; named technical sales representative for the same area was **Clifton S. Skow.**

C. J. Schmidt, who has been in charge of the Detroit office of J. O. Ross Engineering Corp., was recently named vice president of the firm in charge of sales. Mr. Schmidt, who has been with the firm since 1930, will headquarter at J. O. Ross' New York, N. Y. office. . . .Farrel-Birmingham Co. Inc. has announced that Roy F. Roop has been named to the Chicago sales staff.

Leonard E. Dupras has been appointed a New England sales representative for the pigments division of American Cyanamid Co. He was at one time on the staff of the division's pigment technical service. . . .**Frank T. Peterson,** vice president of the Black-Clawson Co., has returned from Europe, where he completed arrangements with United Paper Mills Ltd. of Copenhagen for a cylinder board machine to be built by Black-Clawson at Hamilton, Ohio.

Edward A. Livingstone, vice president of the Babcock & Wilcox Co., has been elected to the board of directors and placed in charge of the firm's Tubular Products Div.

Coming Events

TAPPI

Sept. 20-24—Research Conference on the Fundamentals of the Paper Machine (joint session with CPPA's Technical Section), the Institute of Paper Chemistry, Appleton, Wis.

Oct. 6-8—Alkaline Pulping Conference, Dinkler-Tutwiler Hotel, Birmingham, Ala.

American Pulp & Paper Mill Superintendents Association

Sept. 2-4—New York-Canadian, Saranac Inn, Upper Saranac Lake, N. Y.

Sept. 16-17—Northwestern Division. Breezy Point Lodge, Brainerd, Minn.

Sept. 23-26—Northeastern Division, Poland Spring House, Poland Spring, Maine.

Other meetings

Sept. 1-16—International Electrotechnical Commission, Golden Jubilee meeting, University of Pennsylvania, Philadelphia.

Sept. 6-9—American Forestry Association (annual convention), Multnomah Hotel, Portland, Ore.

Sept. 9-10—National Paper Trade Association, fall meeting, Conrad Hilton Hotel, Chicago.

Sept. 15-21—Instrument Society of America, First International Instrument Exposition, Convention Hall, Philadelphia.

Sept. 20-24—CPPA Technical Section, International Symposium on the Fundamentals of the Paper Machine (joint session with Tappi), the Institute of Paper Chemistry, Appleton, Wis.

Sept. 23-24—National Flexible Packaging Association (fall meeting), Moraine on the Lake, Highland Park, Ill.

Oct. 3-7—Electrochemical Society Inc., Statler Hotel, Boston.

Oct. 12-14—Society of American Foresters (annual convention), Milwaukee (tentative)

Oct. 18-22—42nd National Safety Congress and Exposition, Chicago.

Nov. 15-17—American Standards Association, Fifth National Convention on Standards, Hotel Roosevelt, New York, N. Y.

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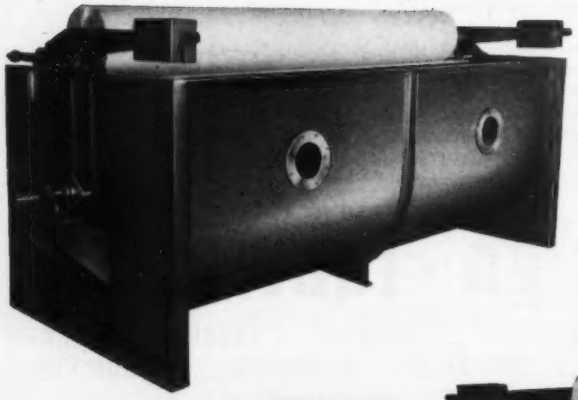
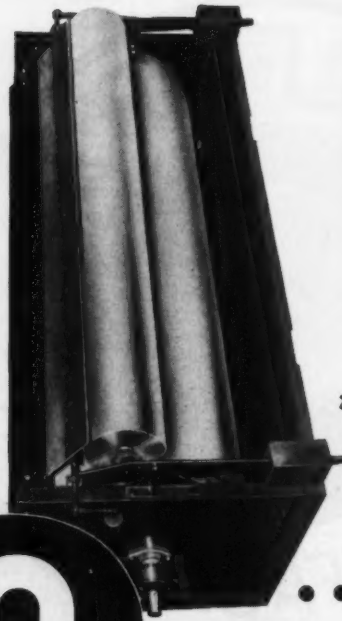


VIEW OF END AND INTAKE SIDE OF COWAN DECKER

VIEW OF EFFLUENT DISCHARGE END FROM INTAKE SIDE



TOP VIEW SHOWING RUBBER-COVERED COUCH ROLL AND 48"DIA.– 131" CYLINDER MOULD

...the Cowan Decker shows its superiority!

COWAN DECKER PRODUCTION FIGURES:

35 tons/day — Groundwood
85 tons/day — Sulphite
100 tons/day — Kraft

APPLETON MACHINE COMPANY
APPLETON
WISCONSIN

Exclusive U.S. licensee for Cowan Deckers

NAMES *in the* NEWS

Becker Becomes Rhinelander Board Chairman; Succeeded by B. R. Cancell

Folke Becker, for 19 years president and general manager of Rhinelander Paper Co., will become chairman of the board October 1. Although Mr. Becker will remain as "chief executive officer," according to a company announcement, he will be succeeded as president by Benton R. Cancell. Mr. Cancell has been operating vice president.

Other changes in the top management of the Rhinelander, Wis. company include the election of J. H. Fennema as treasurer to replace Ed S. Houlehan, who has retired after 36 years' service. Mr. Fennema was formerly controller.

E. E. Mason, assistant sales manager, has been named sales manager, a post that has been vacant for some time.

Mr. Becker, prominent for many years in the timber and paper industries, is also president of Trees for Tomorrow Inc., the industry's reforestation agency in Wisconsin.

Two Receive Promotions at Champion P & F

Promotion to positions of a supervisory nature have been authorized for two men at the Ohio division of the Champion Paper & Fibre Co., Hamilton, Ohio. Frank McKinney and Robert Witters, both of whom are 20-year veterans in papermaking, have been named boss machine tenders in No. 1 machine room.

Mr. Witters, who joined the Champion staff in 1933 as a machine room helper, was until his current promotion first hand on a fourdrinier. Similarly, Mr. McKinney, who also started his Champion career in 1933, was given the position of machine tender after his dicharge from World War II service.

Westbrook Steele Award

Dr. Samuel M. Rollinson has been announced as the recipient of the 1954 Westbrook Steele gold medal. Dr. Rollinson was a June graduate of the Institute of Paper Chemistry with the Ph. D. degree.

The award was established in 1941 by Westbrook Steele, president of the Appleton, Wis. school, and is presented annually by vote of the faculty to the graduate whose doctoral thesis is most outstanding.

Dr. Rollinson, a native of Savannah, Ga., received the B. Ch. E. degree from Georgia Institute of Technology in 1950 and the M. S. degree from Lawrence College (the Institute of Paper Chemistry) in 1952. His thesis was, "An Investigation of the Accelerated Brightness Reversion of Bleached Slash Pine Kraft Pulp."

Dr. S. M. Rollinson

H. F. Dunning

H. F. Dunning, vice president of Scott Paper Co., Chester, Pa., has been elected to the board of directors of the American Management Association.

Alton Names Zeitlin

The appointment of Frank Zeitlin as production manager to succeed J. E. Becker has been announced by Alton Box Board Co. of Alton, Ill. Mr. Becker resigned effective July 1.

Mr. Zeitlin comes to Alton from West Virginia Pulp & Paper Co., where he has been employed for the past 24 years. For the last six months he has served as staff assistant to the executive vice president. During his career with Westvaco, he served in various technical and research capacities in the firm's diversified mills.

Crown Zellerbach Advances Two

Promotions of two Pacific Northwest men to positions of higher responsibility have been announced in San Francisco by Crown Zellerbach Corp.

Ralph D. Dickey of Portland, Ore., becomes resident manager of the Seattle headquarters office, in addition to continuing his responsibilities as Pacific Northwest sales manager. With the exception of service during World War I, Mr. Dickey has been with the firm since 1917.

Kenneth C. Osier of Seattle has been named president of International Pulpwood Supply Co. (Seattle) and of International Pulpwood Supply Co. Ltd. (Vancouver). He joined C-Z nine years ago at Port Angeles, Wash., as log and pulpwood buyer. He became head timber buyer for the Puget Sound area in 1949.

Chemists Promoted by Rayonier in Florida

Harry G. Taylor has been appointed chief chemist at the Fernandina (Fla.) division of Rayonier Inc. Named assistant chief chemist of the same division was E. P. ("Bud") Wilson.

Mr. Taylor joined the firm in 1944 as a shift chemist and held that position until 1952, when he was appointed assistant chief chemist. Mr. Wilson joined Rayonier in 1937 following association with the chemistry department of the Montana State Experimental Station. He was later transferred to the central research laboratory as a viscose chemist and in 1939 was transferred to Fernandina, where for the past several years he has served as laboratory supervisor.

Collett Joins Consolidated

Groff Collett has joined the staff of Consolidated Water Power & Paper Co. in Wisconsin Rapids, Wis. Formerly business manager of the Sulphite Pulp Manufacturers Research League, he has been assigned special projects in connection with long-range planning.

A native of St. Joseph, Mo., Mr. Collett is a graduate of Kenyon College and holds a Master of Science degree in business and engineering administration from Massachusetts Institute of Technology.

Scott Names Treasurer

The board of directors of Scott Paper Co. has elected Paul B. Wyant treasurer of the firm. W. R. Scott III,

vice president and treasurer, has resigned the latter office and will continue only in the vice president capacity.

A graduate of the Wharton School of the University of Pennsylvania, Mr. Wyant was associated with Myles F. Conners, an investment adviser, from 1941 until Mr. Conners' death in 1945. He then formed his own firm, Paul B. Wyant & Co., to continue in an advisory capacity to individuals, organizations and institutions.

Charles H. Sage, a vice president of Kimberly-Clark Corp., has been named to a 12-man study committee by the United States Congressional Commission on Inter-Governmental Relations. The group will study state and federal aspects of land and water management, use and conservation of natural resources.

Names in the News . . .

Adam C. Remley, Nekoosa-Edwards Paper Co. vice president in charge of sales, retired July 1. Mr. Remley joined the firm in 1935 as assistant general sales manager. He became general sales manager in 1936 and vice president for sales in 1947. A past president of the Writing Paper Manufacturers Association, Mr. Remley will become a private consultant in paper sales and merchandising.

Charles L. Walton of Evanston, Ill., has been appointed production manager of the insulation division of United States Gypsum Co. He was formerly production engineer.

C. L. Walton

J. E. Jack

John E. Jack has been made production assistant for refining and coloring at the Sorg Paper Co. in Middletown, Ohio. He was formerly supervisor of the refiner room at the Sorg mill.

Research League Promotes Two at Appleton

The Sulphite Pulp Manufacturers Research League of Appleton, Wis., has announced two staff promotions and the addition of a scientist to its executive group.

Milton A. Lefevre, for the past nine years the League's chief chemical engineer, has been named associate director. Miss Helen M. Faas, office secretary, has been appointed office manager.

And Dr. Robert Lee Smith has been added to the staff as assistant director. Formerly of Iowa State College, he holds a doctor's degree in biochemistry and is chairman of the Protein Economics and Research Council.

T. D. Currie, M. B. E., has been elected vice president and general sales manager of Dixie Cup Co. (Canada) Ltd., Brampton, Ont. A native of England and a veteran of 27 years with the firm, he has at various times directed the sales division, the production division, and has handled financial and corporate matters.

Fred North has been appointed plant fire marshal for Charmin Paper Mills of Green Bay, Wis. He succeeds Adam Prechter, who retired May 31.

"From ingot to fourdrinier wire"

QUALITY-CONTROL THROUGH THE LABORATORY

Shown here is a small section of our laboratory, which is housed in its own building and is completely equipped with the most modern instruments.

Its staff is dedicated to a two-fold purpose:

1. *Quality control during every phase of fourdrinier wire manufacture.*
2. *Constant study, research and evaluation for future progress.*

From the raw metals to your finished fourdrinier wires, we are proud to say they are *truly ours*—scientifically controlled from the ingot to the finished product.

EASTWOOD-NEALLEY CORPORATION
Belleville, N. J.

Ernest Berryman of Nekossa-Edwards Paper Co. has been named general chairman of the 1955 Wisconsin River Valley Safety Conference.

Ernest E. Brown has been elected vice president of National Container Corp. of Ohio, the multiwall bag division of National Container Corp. The operation includes plants at Jaite, Ohio, and Kansas City, Mo.

E. E. Brown

F. J. Sullivan

Frank J. Sullivan has been named manager of the Ohio Corrugated Box Division of Robert Gair Co. Mr. Sullivan, who will be located in Cleveland, has been special sales representative for the firm's container division at the New York, N. Y. office.

Lester J. Smith has been named production manager of the Deferiet, N. Y. mill of St. Regis Paper Co. He was formerly resident manager at the Harrisville, N. Y. operation, following the sale of which he was assigned to the Carthage mill.

Case Bros. Inc. of Manchester, Conn., has announced the election of **Wells C. Dennison** as president and of **James W. McKay** as treasurer. Mr. Dennison was previously vice president and treasurer, while Mr. McKay was assistant treasurer.

F. Marshall Bragg, formerly a design engineer for Carbide & Carbon Chemicals Co., has been named power plant engineer for Albemarle Paper Mfg. Co. of Richmond, Va.

Arne J. A. Asplund, board chairman of A. B. Defibrator of Stockholm, Sweden, was recently presented a Citation Award by the College of Engineering of the University of Wisconsin. A graduate of the university, Mr. Asplund is the inventor of the Asplund continuous pulping process.

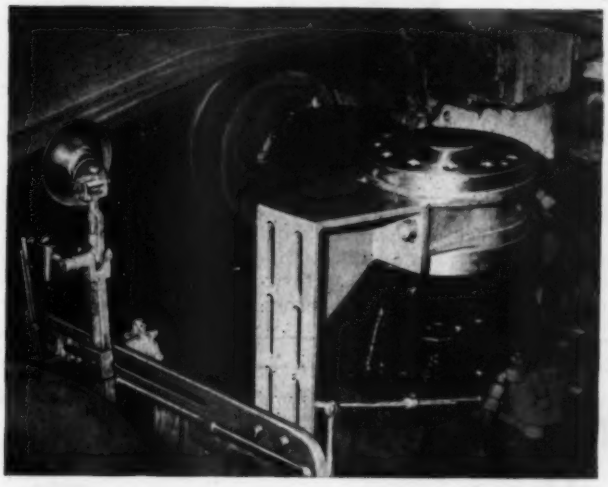
Marathon Corp. at Menominee, Mich., has announced three promotions in the quality control department: **Benjamin C. Ferstrum** has been named assistant supervisor; **Donald J. Minsloff,** project technician, and **Cornelius Wilke,** shift technician.

C. A. Pertain has been named assistant controller for Marathon Corp. at Menasha, Wis. He has been assistant to Milan Boex, vice president for the northern sales division, since November 1953, at which time Northern Paper Mills merged with Marathon.

Paul V. Connelly has been appointed assistant to the president of Lathrop Vandewater Paper Co. of New York, N. Y., a subsidiary of Chesapeake Industries Inc. For the past several years he has been assistant professor of economics at Manhattanville College.

Dr. Sonja K. Gross, the only woman on the research staff, has been named research assistant in forest chemistry at the New York State College of Forestry, Syracuse.

David L. Luke III and **Wiley L. Jennings,** both vice presidents of West Virginia Pulp & Paper Co., have been elected directors of Hinde & Dauch Paper Co.



teaching a wire to toe the line...

It's model 706, new Gilbert & Nash Hydra Guide with rotary palm* for wire, wet felt, and dryer felt service. Shown in actual use—now in its second year—at Sorg Paper Company, Middletown, Ohio, #6 machine, Smith mill.

High speed machines—even variable speed machines—are no handicap to model 706. Its guide roll moves only in a *horizontal* plane to avoid undue wire stretch . . . continuously corrects at a plus or minus 1/64 inch . . . eliminates over-correction or hunting.

Hydraulically operated by water pressure—where filtered water pressure is 40 to 60 lbs.—or by oil pressure with a pump of one gallon per minute capacity. Send for free Hydra Guide folder or, at no obligation, write for a Gilbert & Nash representative to call at your mill.

GILBERT and NASH MENASHA, WISCONSIN

*Manufactured and sold exclusively by The Appleton Machine Company

NECROLOGY

Hale Holden Jr.

Hale Holden Jr.

Hale Holden Jr., president of Byron Weston Co. at Dalton, Mass., died June 30 in a New London, Conn. hospital. He was 54.

A native of Kansas City, Mo., Mr. Holden was a 1922 graduate of Yale University. Following graduation, he became associated with the Pullman Co. in Chicago and in 1931 was appointed vice president of the firm's eastern district.

Mr. Holden resigned from Pullman in 1942 to assume the presidency of Byron Weston. He was a grandson of the company's founder and had been a director of the firm for several years.

Long active in the Writing Paper Manufacturers Association, Mr. Holden had been elected president of the organization during the February APPA convention.

C. E. Carey

Charles E. Carey, 61, president of Central Fibre Products Co. and prominent Hutchinson, Kans. philanthropist, died at his home July 9.

From 1914 to 1918 Mr. Carey was active in the Carey Salt Co. in Hutchinson, becoming vice president and general manager of Emerson Carey Fibre Products Co. in the latter year. In 1931, when Central Fibre Products was organized, he became one of the executive officers. He was elected president of the firm in 1945.

Dr. Jacques Edwin Brandenberger, Swiss-born inventor of Cellophane, died July 13 in Zurich at the age of 81. Dr. Brandenberger developed the world-famous product in 1908 while working as a dye expert in Remiremont, France. He sold the formula to E. I. du Pont de Nemours & Co. for manufacture in the United States.

Mrs. Elizabeth M. Lee

Mrs. Elizabeth M. Lee, vice president and member of the board of Lockport Felt Co. of Lockport, N. Y., died May 24 following a long illness. She was the widow of William H. Lee, board chairman and founder of the firm, who died April 29.

A native of Lockport, she was born in 1876. Mrs. Lee graduated from teachers college and taught school in the New York community for several years prior to her marriage in 1905, the year of her husband's first association with the then all-but-bankrupt Lockport Felt.

S. Leslie Tattersall

S. Leslie Tattersall, 59, secretary-treasurer and sales manager of Union Mills Paper Mfg. Co. at New Hope, Pa., died June 11 at Princeton, N. J., where he had made his home for many years.

A graduate of the University of Pennsylvania, Mr. Tattersall served with the A.E.F. during World War I as a captain of field artillery. He was also treasurer of Universal Paper Bag Co. of New Hope and a director of the Princeton Savings & Loan Association.

E. M. Hatton

E. M. Hatton, 85, for 12 years manager of Wisconsin Pulpwood Co., died at his Neenah, Wis. home June 19. Wisconsin Pulpwood purchased much of the timber used by the state's pulp and paper industry.

A native of Menominee, Mich., Mr. Hatton went to Neenah at the urging of the late F. J. Sensenbrenner to become head of the pulpwood firm. Mr. Sensenbrenner was president of Kimberly-Clark Corp. Mr. Hatton later was named secretary-treasurer of Jagerson Fuel Co. and for many years was president of the Neenah fire and police commission.

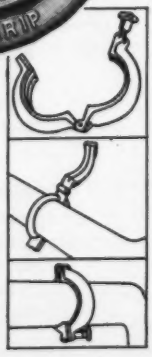
Charles S. Davis, 77, chairman of the board and former president of Borg-Warner Corp., died in Paris July 2 while on a European vacation.

William R. Morpeth, formerly manager of white pigment sales for E. I. du Pont de Nemours & Co., died June 21 at his Maplewood, N. J. home. He was 67. Mr. Morpeth had been with the firm 35 years.

THE *New* "VEE GRIP" STOCK-PIPE FLANGE *offers:*

- QUICK ASSEMBLY
- PERFECT ALIGNMENT
- LOW COST
- EASIER CLEANOUTS

Can be adapted to any standard tubing size with minor change in O.D. of face ring.



With stock lines in paper mills it is often necessary to break connections for cleaning purposes or wash outs. Quick assembly and disassembly of these stock lines is possible with the "Vee Grip" flange. This is a ductile iron cast flange with brass connections for the hinge and threaded rod. This flange is designed for use with fabricated monel and stainless steel stock lines.

The two face rings and gasket are wedged into a V groove in the flange which is quickly placed around the joint and locked into place. As the hand-wheel is tightened down, drawing the two halves together, the face rings of the pipe are wedged tightly together. This gives a water tight connection which will handle shock pressures up to 100 pounds.

V GRIP PIPE FLANGES

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Size with the *lighter glue*—Armour "A B" Chrome Hide Glue!

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When you buy Armour "A B" Chrome Hide Glue you get the lightest glue on the market. "A B" is made from only selected chrome leather stock and produced with all the skill and experience of our 69 years of glue making. The inherent brightness of "A B" is reflected in brightness of sheet.

Armour "A B" Chrome Hide Glue produces a strong, colorless, protective film that improves firmness, strength, rattle, resistance to tear, erasing and folding, and prevention of feathering. This improved product contains no free grease to cause "birds' eyes". Due to the fineness and uniformity of particle size, it is readily soluble and dispersible. It is slightly alkaline, with a PH range of from 7.2 to 7.8.

In other applications, there are exceptional Armour adhesives, such as our special hide glue for use as a colloidal flocculent for the retention of fiber and filler. We have other glues for "on machine" creping directly from the Yankee Dryer that contribute the tacking properties necessary for softness in paper tissues. Write today for complete information and prices on Armour glues for paper making.

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SAFETY NEWS

Southern Association First Quarter Report Shows Vast Improvement

FIFTEEN MEMBER MILLS of the Southern Pulp & Paper Safety Association reported perfect records for the first quarter of 1954.

According to the association, the average injury frequency for the 58 participating mills during the first three months of the year was 6.93, down more than 18 per cent from the 8.52 rate of 1953.

Among bag plants in the converting segment, four operations had perfect records, while the over-all frequency in this department was 5.04 for the first quarter. This rate is down a startling 58 per cent from the 12.12 of 1953.

Participating box plants — also listed in the converting section — showed four perfect scores and an over-all frequency of 3.32. Such represents another outstanding gain over 1953 — an improvement of more than 76 per cent.

There were three 0.00 frequency rates among the seven woods operations competing in the contest. In this area the first quarter frequency rate was 20.54, down nearly 11 per cent from 1953.

Perfect records listed

The 15 firms boasting perfect scores among the mills (man-hours of exposure in parentheses) were: the Champion Paper & Fibre Co., Canton, N. C. (1,467,057); Sonoco Products Co., Hartsville, S. C., (810,520); International Paper Co., Camden, Ark. (631,867); Ecusta Paper Div. of Ecusta Paper Corp., Pisgah Forest, N. C. (567,167); Crossett Paper Mills, Crossett, Ark. (411,843).

Brunswick Pulp & Paper Co., Brunswick, Ga. (360,229); the Buckeye Cotton Oil Co., Memphis (340,873); Macon Kraft Co., Macon Ga. (289,084); the Flintkote Co., Meridian, Miss. (194,736); the Mead Corp., Sylva, N. C. (128,782).

National Container Corp of Virginia, Big Island, Va. (118,123); Orange Pulp & Paper Mills Inc., Orange, Texas (113.556); Certain-Teed Products Corp., Savannah, Ga. (109,777); the Mead Corp., Nashville, Tenn. (47,840), and Hammond Bag & Paper Co., Wellsburg, W. Va. (14,223).

Bag Plants

The firms among the bag plants that had frequency rates of 0.00 for the first quarter were Hudson Pulp & Paper Corp., Palatka, Fla. (312,312); Gulf States Paper Corp., Tuscaloosa, Ala. (223,080); St. Regis Paper Co., Franklin, Va. (205,938), and Kraft Bag Corp., St. Marys, Ga. (140,524).

Box Plants

Union Bag & Paper Corp. at Savannah, Ga., was the leader among box plants reporting perfect scores. The firm worked 171,442 man-hours in the three-month period. Others with 0.00 frequency rates were International at Georgetown, S. C. (109,252); International at Springhill, La. (104,165), and St. Joe Paper Co. at Port St. Joe, Fla. (39,713).

Woods Operations

The three woods operations with perfect records were Union Bag & Paper, Savannah (131,723); Rayonier Inc., Fernandina Beach, Fla. (47,551), and the Mead Corp., Lynchburg, Va. (960).

•

1953 All-Industry Safety Record Shows Gain; Pulp, Paper Improve

Workers employed by member firms of the National Safety Council had the safest year on record in 1953, bettering the previous record performance achieved in 1952. They had fewer on-the-job accidents in 1953, and the ones they did have were less serious.

Among the 40 basic industries, pulp and paper ranked 25th in frequency with a rate of 9.54. For 1952 pulp and paper was in 23rd place with a rate of 10.06. So, although the industry showed a drop in standing, it recorded a 5 per cent improvement in its over-all frequency.

Thirty-four of the 40 basic industry classifications reduced their frequency rates (disabling injuries per 1,000,000 man-hours), and 24 reduced their severity rates (time charges — in days — per 1000 man-hours).

The average accident frequency rate for employees in all industries submitting company reports to the Council was 7.44 in 1953 — a reduction of 11 per cent from 1952.

The communication industry again led all others by turning in the lowest employee frequency rate. Its rate was 1.22, a 10 per cent reduction. Electrical equipment ranked second with 2.88, followed by the automobile industry with 3.39. The relative positions of these industries were the same as in 1952.

Lumbering stayed at the bottom of the frequency list in 1953 with a rate of 33.71, but this represented a 5 per cent reduction. Coal mining remained in the next-to-last spot with 28.81. Mining (other than coal) was third from the bottom, just below marine transportation.

Severity rate decreases

The average accident severity rate for all industries reporting to the Council was 0.83 in 1953, a decrease of 6 per cent from 1952.

Pulp and paper ranked 26th in severity, with a rate of 0.89, down 9 per cent from 1952, when its rate of 0.98 put it in 27th place.

Communications also had the lowest severity rate, leading all other industries with a rate of 0.10, an 8 per cent increase from 1952. Wholesale and retail trade slipped from second in 1952 to sixth in 1953, with tobacco moving from third to second. Electrical equipment was third.

Three industries had reductions in their severity rates of more than 50 per cent — air transport, 64 per cent; leather, 60 per cent, and storage and warehousing, 58 per cent.

In terms of severity, coal mining once more stayed at the bottom of the list, with a severity rate of 4.79. However, this represented a 23 per cent improvement. Quarrying, next to last in 1952, moved ahead of mining (other than coal) and lumbering with a 46 per cent reduction. A 16

per cent increase dropped lumbering to the next-to-last spot.

•

143 Perfect Records in 5-Month Contest Period

A total of 143 pulp, paper and logging firms competing in the 1954 NSC safety contest maintained perfect records for the January-May period. There are 508 plants entered in the annual race for the Edward Benton Fritz Trophy donated by THE PAPER INDUSTRY.

The five-month tabulation shows that for all divisions the over-all frequency rate of 9.77 is down 12 per cent from 1953. The rates for the respective divisions: Pulp and Paper, 6.58; Paper Converting, 8.04, and Pulpwood Logging, 96.23.

•

Industry Safety Notes

Crossett Paper Mills of Crossett, Ark., on June 28 passed the 1,000,000th hour without an accident, the second time such a record has been established by the plant and a record equalled very few times in the South. There has been only one lost-time accident in the past 595 working days.

Sutherland Paper Co. of Kalamazoo, Mich., has been presented the Directors' Safety Award of the Folding Paper Box Association of America. The honor represents 1,000,000 man-hours in the converting plants without a lost-time accident.

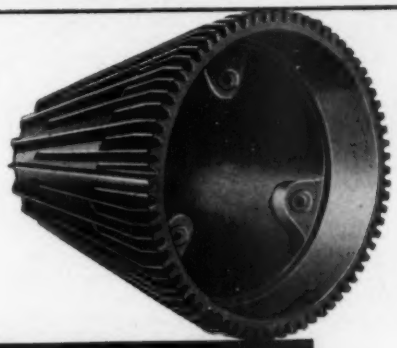
Falls Paper & Power Co. of Oconto Falls, Wis., a subsidiary of Scott Paper Co., has received the National Safety Council's Award of Honor for its 1953 industrial safety record of more than 1,000,000 man-hours without a lost-time accident.

National Container Corp. has announced that its Tomahawk, Wis. box shop division had a perfect safety record in 1953. The achievement of no lost-time accidents has earned for the plant the Inter-Plant Safety Plaque. The mill division award went to the Ontonagon, Mich. kraft pulp and paperboard operation, also for a perfect record.

Publishers' Paper Co. at Oregon City, Ore., has received a National Safety Council award of honor for its 99 per cent reduction in accident frequency since 1945.

Quebec North Shore Paper Co. of Baie Comeau, Que., has won the award for "the Safest Mill in Canada" for plants operating more than 75,000 man-hours per month. The Newcastle, N. B. mill of **Fraser Companies Ltd.** was the winner in the less-than-75,000 class.

EASY AS 1-2-3 to renew your Jordan Plugs!



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Patented
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Instead of dismantling complicated shaft and plug assemblies each time the plug is worn, put on a permanently mounted TISCO plug core and TISCO demountable plug sleeve. Thereafter, the shaft and core remain permanently . . . simply remove the worn sleeve by loosening 3 bolts—put on new sleeve by tightening bolts. Requires a fraction of former time, costs much less.

TISCO Solid Cast Plug Core permanently mounted on shaft.

You not only get faster servicing with TISCO Demountable Jordan Plug Sleeves, but you get *longer service* because they are soundly cast of wear-resistant TISCO Manganese Steel. This extremely tough, hard steel resists impact and abrasion—wears slowly without chipping in severest service with rough, heavy or dirty stock.

TISCO Jordan plugs, sleeves and liners are cast in one piece. Integral plug bars are machine-ground to accurately fit the shell bars. Careful balancing permits high peripheral speeds without tremor. Investigate the advanced, time-saving TISCO demountable sleeve and core design for your Jordan fillings.

Also: TISCO Manganese Steel Beater Rolls, Rag Slitters, Conveyor Chain, Barking Drum Chain, Sprockets, Log Haul Attachments and Rotor Vein Segments for Hydropulpers.

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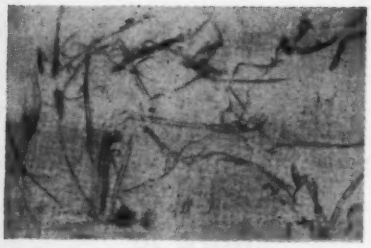
FOREIGN ABSTRACTS



Chemical combination of lignin in aspen

Wood is extracted repeatedly with buffered neutral (pH 7) water and butanol at 158° C. This treatment causes the gradual solubilization of the wood, and both the wood residues and the liquors are analyzed after each cook, nine of which are made. Not only is the lignin solubilized, but carbohydrate material is also removed. Initially, experiments are made both with pine and with aspen, but only the latter is sufficiently soluble under the conditions used, so the series is carried out with this wood. The coarseness or the fineness of the wood has but little effect on its solubility.

During the nine consecutive aspen cooks 62.5 per cent of the total wood and about 92.6 per cent of the original lignin dissolved. In cooks two to five the ratio of the lignin to the pentosans was nearly constant (at 0.85). After cook five, the wood residue was about 51.2 per cent. In cooks six to nine, the lignin/pentosan ratio dropped to about 0.64. This drop in ratio was quite abrupt (during the sixth cook). With this change a marked change in the methoxyl content of the recovered lignin was also noted. The recovered (Klason) lignin first contains 20-21 per cent methoxyl.

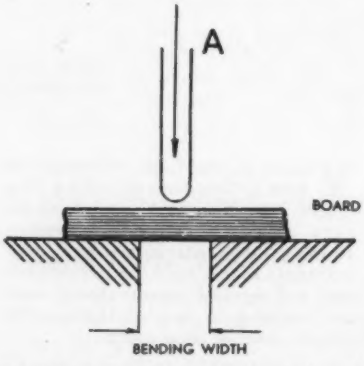
The original aspen contained lignin, the methoxyl content of which was 20.2 per cent. After the first three treatments, the lignin methoxyl in the *residual* wood remained approximately constant at 15.4-16. per cent. The assumption is made that the lignin forms with the pentosans two different types of complexes, and that in each of these the character of the lignin varies. Simultaneously with this change in lignin/pentosan ratio a distinct defibration of the wood substance is observed, indicating that the middle lamella has been dissolved at this stage and that there is a connection between these lignin complexes and the morphology of the woody tissue. The complex with the lignin/pentosan ratio of 0.85 seems to belong to the middle lamella and is removed during the earlier part of the digestion. The authors believe that when the ratio 0.65 is reached the secondary layer of the wood is involved. When this complex dissolves, appreciable amounts of the cell-wall cellulose is also removed. There is also a possibility that this cellulose is combined with some lignin. In the very first digestion, the lignin/pentosan ratio is 1.35; this may be due to the removal of *free* lignin from the middle lamella.

The authors explain the entire mechanism somewhat as follows: the hydrolytic action of the water cleaves the bonds between lignin and the carbohydrates. The former dissolves in the butanol and the latter in the water. Buffer effects prevent the condensation of the lignin. Qualitative sugar analyses after acid hydrolysis of the water soluble components indicate (by paper chromatography) that xylose, arabinose, galactose, glucose, uronic anhydryde, and small amounts of mannose and rhamnose are present.

The appearance of the "pulp" after the ninth cook is shown in the accompanying figure. Eleven tables, three graphs, two diagrams, and various half-tones; 41 literature references. Erkki Aaltio and R. H. Rochier. Paper and Timber (Finland), 36, No. 4a, 157-174 (1954) (original in Finnish, with English summary).

Creasing of board

In part this is a repetition and in part an amplification of work previously published by the Graphic Arts Research Laboratory, Stockholm. (Cf. *Svensk Papperstidn.*, 56, 328 [1953] and The PAPER INDUSTRY, 35, No. 6, 694 [1953].)



Principle sketch showing creasing of board. A = creasing rule

The accompanying figure shows the principle involved in the creasing test. From the results of the experiments herein described, it appears that a board should should be bent across the fiber. A board conditioned at 65 per cent relative humidity shows a lower strength than one conditioned at 50 per cent R.H., but the author discusses the complications involved in such a test.

The question as to the type of creasing rule to be used is also raised, and it has been shown experimentally that whether or not a sharp-edged rule or a round-edged rule is used must depend on the type of board to be tested. The importance of choosing the proper creasing rule shape is discussed; and it is evident that, by a proper choice, boards which under normal conditions would be considered unsuited for creasing could still give satisfactory results. To be bent the board should not have a pronounced fiber orientation.

The author finds no correlation between pliability and tensile strength, burst, or rigidity; however, there is a correlation between pliability, folding endurance, and compressibility. A high number of folds and high compressibility give rise to good pliability. Three tables, 15 figures, and 11 references are given. Hans Olav Brynhildsen. *Norsk Skogindustri*, 8, No. 4, 125-136 (1954) (in English).

Comparative beating studies; a cooperative enterprise

The studies are carried out with five bleached sulfite pulps, with two unbleached sulfite pulps, and with three unbleached kraft pulps. The participating laboratories are the Aylesford Paper Mills (using their beater), the Research Institute of the Norwegian Paper Industry, at Oslo (using their P.F.I. mill and the Lampén mill), the Svenska Cellulosa Aktiebolaget, at Skönsmon, Sweden (using the Banning Seybold [B-S] beater), the Korsnäs Aktiebolag., Gävle, Sweden (using the Valley beater and the B-S beater) and the Central Laboratory A B., at Helsingsfors, Finland (using the Valley and the Noble and Wood beaters and the Lampén mill). The pulps are all sent out by the Central Laboratory A B. and are beaten according to the method of each individual labpratory and made into sheets by the British method (Tappi standard 205), as well as the techniques in use by each specific laboratory.

The differences found in strength properties are due partly to differences in the sheet-making conditions, especially the wet pressure; but in the main, they are due to the type of beating apparatus. Irrespective of the techniques used in sheet making, all of the beaters serve to grade the strength properties of the various pulps, placing them in the same order of quality, *with the exception of the soft bleached sulfite pulps*. In most of the beating equipment, the grading of unbleached sulfite and kraft pulps (on the basis of beating time at any given water content) is found satisfactory. Grading of bleached sulfite pulps is not satisfactory.

The P.F.I. mill and the Valley beater give strength values in good agreement

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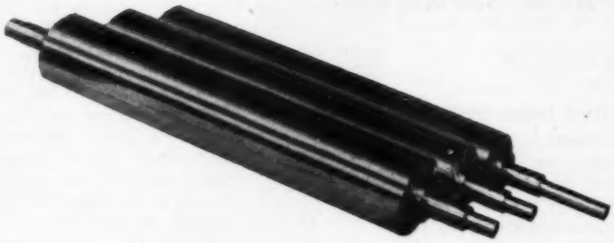

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with each other. The Aylesford and B-S beaters show good agreement with regard to tensile, burst, fold, and opacity values, but not in the case of tear, apparent specific gravity and air permeability. The Aylesford gives denser sheets with a lower tear and higher apparent specific gravity than does the B-S beater. The Lampén mill gives lower opacity values for all pulps than does the barred beaters. The Aylesford and B. and S. beaters show the lowest *reduction* in opacity values. The Lampén mill shows a tendency to "overbeat" very soft pulps, and so the strength properties suffer by comparison with those attained by the use of other beaters.

Six tables, 24 figures, and 12 references are given. Torsten Ekstam, *Svensk Papperstidn.*, 57, 204-224 (1954) (original in Swedish, with English summary). (Many of the figures have English captions.)

Fatalities in a kraft digester

An unusual accident caused the death of three men in a sulfate mill in Finland in 1953. During the course of periodic repairs, with concomitant removal of deposits in the circulatory system of a digester, the latter was partially filled with wood chips so that the crew could stand on them and thus reach the piping in the upper part of the digester. This appears to be common practice and has been carried out with impunity in the past. Several digesters had already been cleaned in this way.

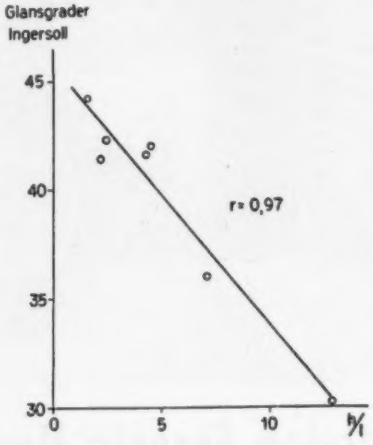
Inasmuch as welding operations had been carried out above the digester (in which the deaths later occurred), the cover had been replaced to keep sparks from getting into the wood. Thus, the digester had been sealed for 48 hours. Two students removed the cover on Monday and, with the aid of a rope ladder, climbed down into the digester to a point about 3.4 meters below the digester opening. After about 15 minutes, a third worker looking into the digester discovered their lifeless bodies and climbed down to effect a rescue. He himself died. A fourth worker very nearly suffered the same fate. Finally, by using oxygen and masks, the bodies could be removed. It was found that in the hermetically sealed digester nearly all the oxygen had been removed above the chips and that the upper gases contained 12-16 per cent carbon dioxide. No toxic gases (other than 0.008-0.01 per cent carbon monoxide) were present; the men had simply been suffocated.

Wet spruce or pine chips (especially from sapwood) have the capacity of absorbing nearly all the oxygen from air in a sealed vessel within a few days, and of giving off carbon dioxide. This could not happen in an open digester; but in view of the experience, the use of a fan is strongly recommended. K. K. Karlson. *Svensk Papperstidn.*, 57, 29 (1954) (original in Swedish; English summary in *Bull. Inst. Paper Chem.*, 24, 573 [1954]).

Gloss in machine glazed papers

The measurements in this study are made with the Ingersoll glarimeter. The following factors are varied: the amount of rosin size, starch and clay in the furnish, the pH, the lignin (I) and hemicellulose (II) contents of the pulp (especially the ratio of II:I).

Only in the case of sized papers is the gloss affected by pH. The gloss is apparently independent of the amount of rosin size. On the other hand, the gloss *increases* with decreasing values of II:I. (This is shown in the accompanying figure, where h/1 equals II:I). In some cases



the gloss is improved by adding small amounts of starch and clay. Four tables and three figures. V. Peterson. *Svensk Papperstidn.*, 57, 191-3 (1954) (in Swedish, with English summary).

Use of a modified Jokro mill in laboratory beating

The author describes the Jokro mill and its use in the laboratory in beating sulfite pulps. The mill is also altered by eliminating the usual grooves in the beater roll and then making beater runs under similar conditions. Experiments indicate that the tensile, tear, burst, and folding endurance of sheets made from pulps beaten in the modified apparatus are nearly the same (respectively) as are those of sheets made from pulps processed in the ordinary Jokro mill. This is shown in a series of graphs. It appears, therefore, that grooving is less essential than previously assumed. J. W. Kenworthy. *Norsk Skogindustri*, 8, No. 3, 103-5 (1954) (in Norwegian, with an English summary).

Modern trends in papermaking felts

This is a comprehensive review dealing with the important functional characteristics of wet-end felts, and those agencies (mechanical abrasion and chemical and microbiological attack) which cause woolen felt degradation. The author also discusses the use of fibers other than wool in wet felts and chemical modifications of wool that have been used to improve felt life.

The following topics are also dealt with in some detail: the properties of dryer felts; the widespread substitution of cotton in place of wool and the possible structures of such felts (shown in a series of schematic drawings).

In considering what type of felt should be chosen, the following factors enter into the picture: the type of paper that is to be

manufactured, the economics involved, the paper furnish to be used, the moisture conditions at the dryer section, and the position at the dryers that is to be occupied by the felt.

The function of the felt in assisting water evaporation is also considered. Fourteen figures are given. E. Race. *Svensk Papperstidn.*, 57, No. 10. 353-362 (1954) (in English).

Elimination of bubbles on the Fourdrinier wire

The system described in this article is subject to a patent application. The antifoam compound used is a condensation product of ethylene oxide and a fatty acid which is liquid and readily emulsifiable in water without the addition of another emulsifying agent. The compound is sprayed over the surface of the stock shortly after it has left the slice and is an improvement over mixing the antifoam agent with the stock *before* the slice is reached.

The advantages are a reduction in the amount of chemical required and the fact that its activity is concentrated on the surface of the stock where it is most effective. Using this antifoam agent is claimed to be more effective than the common practice of using steam jets; its cost is less and the humidity of the machine room is not raised.

The method has been used to eliminate air bells from newsprint. Further experiments with other types of stocks would have to be made so as to determine the effects of the chemical on paper properties. G. F. J. Mansell and K. C. Saunders. *World's Paper Trade Rev.*, 140, No. 27, 2045-6, 2048, 2050, 2055-6, and 2058 (1953).

Orienting investigation of the pulping of straw in a Dyno-pulper

Preliminary studies are made with a laboratory Dyno-pulper, using wheat straw that has been pre-treated with hot water. The pulper is operated at 93° C. for time periods that range from seven minutes to one hour, using 8-12 per cent sodium hydroxide. The pulping is very rapid and the resulting product, when tested, shows strength properties that appear to make it suitable for the manufacture of wrapping paper.

The best conditions are obtained with 10-12 per cent caustic soda operating for one-half hour. In this way (with 12 per cent alkali) 42 per cent of the original lignin and about 26 per cent of the original pentosans are removed in the treatment. By increasing the treatment to one hour, about 50 per cent of the straw lignin is solubilized, whereas the loss in pentosans changes very little. The pulp yields, under what are claimed to be identical conditions, vary from 68.7 to 80.1 per cent, the mean about 73.4 per cent. A. Ayroud and H. Jacquemin. *Assoc. tech. ind. papetiere, Bull.* 1954, 84-92 (in French).

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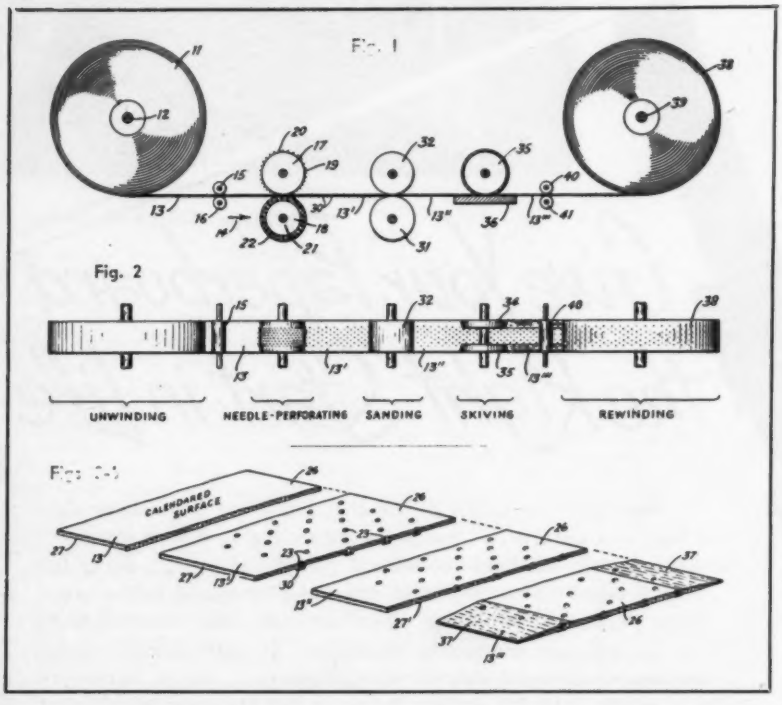

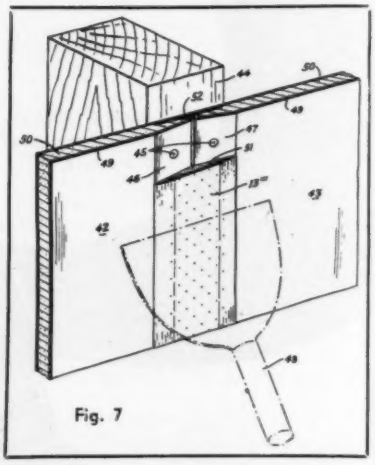

MELVIN NORD*

Wallboard Tape

U.S. 2,667,822, issued Feb. 2, 1954 to Paul Christman, and assigned to Bemiss-Jason Co., describes a novel form of wallboard tape and a method of manufacturing it.

Wallboard tape is primarily used in dry-wall construction in order to produce a smooth, generally invisible joint between abutting wallboard panels, suitable for subsequent painting or wall papering. In order to permit air bubbles to escape from behind the tape, as it is being applied, conventional wallboard tape is perforated with the exception of the edge portions. These perforations are generally produced by punching. A disadvantage of these perforations is that the joint compound tends to flow through the perforations as the broad knife is moved over the tape; this produces pimples which harden and are difficult to remove. If the perforations are made very small, being made by means of electric discharge, the rate of production of the perforations is very slow. The present invention provides perforations small enough to prevent the passage of air, but capable of being produced at a considerably faster rate than "spark tape."

*Patent attorney, 664 Putnam, Detroit, Mich.

As shown in Figs. 1 and 2, a reel of tape 11 is supported on a shaft 12, and tape 13 is withdrawn from the reel in the direction of the arrow 14. The tape at this stage is a parallel-edged strip of paper stock, generally calendered to a relatively smooth surface on both sides. After passing between guide rollers 15 and 16, the tape passes into the nip of a needle point perforator consisting of a needle roller 17 and a pressure roller 18. A good grade of phonograph needles 20 may be used as the projections from the metal roller surface 19. The pressure roller 18 has a metal core 21 over which a facing 22 of rubber is used. The life of the rubber is surprisingly long even though the needles extend into it slightly as the tape passes through the nip. Thus, the tape leaving the nip of the rollers 17, 18 has many

Other Patents of Interest to the Paper Industry

Subject	Inventor or Assignee	Patent No.	Date
Folding mandrel for making packing bags	Firma Fr. Hesser, Maschinenfabrik-A.G.	2,671,383	3/9/54
Collapsible paperboard container	Gibson Patent Containers Ltd.	2,671,592-3	"
Chick box cleat	Alton Box Board Co.	2,671,594-5	"
Shipping container	Container Corp. of America	2,671,597 & 2,671,600-1	"
Corrugated board box construction	John Roen	2,671,598	"
Apparatus for manufacturing wallboard joint tape	The Marvan Corp.	2,671,990-1	3/16/54
Attachment to machines for forming pulp	Lamb-Grays Harbor Co.	2,672,077	"
Suction press assembly	Beloit Iron Works	2,672,078	"
Centrifugal pulp cleaning and screening apparatus	Theodore M. Walters	2,672,238	"
Carton	Thomas K. Smith	2,672,273	"
Collapsible container	Max Factor & Co.	2,672,274	"
Multiple section container	Clifford Rudine	2,672,275	"
Coating composition for paperboard	Gaylord Container Corp.	2,672,454	"
Collapsible partitioned display carton	Sutherland Paper Co.	2,673,023	3/23/54
Alkaline pulping using gaseous oxygen	Hercules Powder Co.	2,673,148	"
Cigarette paper	Ecusta Paper Corp.	2,673,565 & 2,673,799	3/30/54
Striker mechanism for bag-making machines	International Paper Co.	2,673,610	"
Fully partitioned carrier with reinforced handle	The Gardner Board & Carton Co.	2,673,677	"
Collapsible box	Leon E. La Bombard	2,673,679	"
Two-way mailing device	Herman Deutschmeister	2,673,680	"
Shower for pulp washers	Canadian International Paper Co.	2,673,763	"
Method and apparatus for recovering chemical products from waste black liquor	John E. Greenawalt	2,673,787	"
Deinking newspaper slurry	Jean E. Zundeland and Robert S. Aries	2,673,798	"

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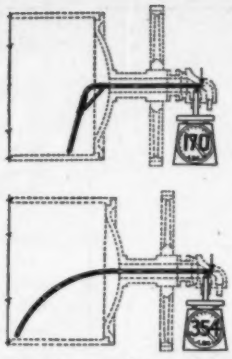

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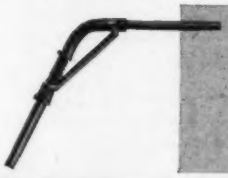
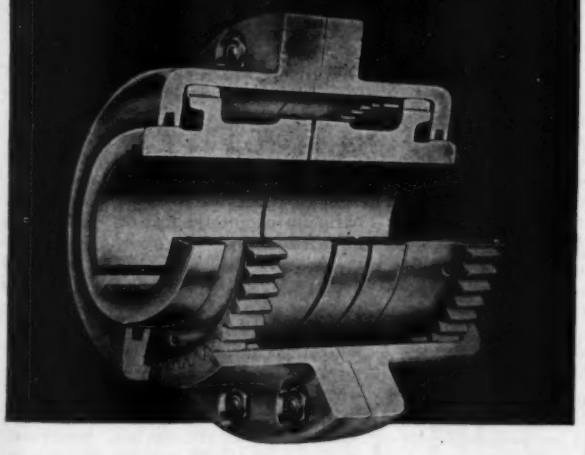


MIDWEST AUTO-FLEX SYPHONS

POOLE



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small perforations extending through it. No stock is actually removed from the tape, but funnel-like apertures are produced at the perforations; these protrude slightly above the back surface of the tape. The protuberances are removed in the next operation. The tape is passed over a sander 31, against which the tape is urged by a pressure roller 32. The sander also uniformly roughens the back surface.

The perforated and ground tape is then skived to reduce the thickness of the edges of the tape. This may be done by means of two grinding wheels 34 and 35, which are dressed to a slight taper. A pressure plate 36 properly spaces the tape from the surface of the wheels 34 and 35. The skiving operation also uniformly roughens the top surface of the tape within the skived areas, but the center of the tape remains smooth and calendered.

The tape is then rewound on a rewinding reel supported on a shaft 39, after passing through guide rollers 40 and 41.

The tape is shown in various stages of its production in Figs. 3 through 6. The method of application of the tape is shown in Fig. 7. The roughened back surface of the tape adheres extremely well to the joint compound as the tape is pressed against it with the broad knife 48.

The force of the blade does not cause the compound to flow through the apertures. This is due partly to the small size of the apertures, and also to the fact that the area immediately adjacent to each aperture appears to have capillary properties tending to withdraw a certain amount of moisture from the compound. This promotes more rapid setting of the compound at the apertures, thereby preventing the formation of pimples.

Doctor for Paper Machines

U. S. 2,673,494, issued March 30, 1954 to Harold E. B. Scott, describes a doctor for papermaking machines, consisting of a holder and a thin blade which is a loose fit in the holder, being biased by gravity (or by springs) so as to maintain the blade in contact with the roll. One form of the apparatus is shown in Figs. 8 and 9.

The holder 20 of the doctor extends along the entire length of the roll 21. The holder has a nearly-cylindrical recess 22 in its face near the roll. A cylindrical retaining rod 23 in this recess has a blade-retaining groove 24 with a flat surface 25 against which the rear edge 26 of the blade 27 rests. The holder is mounted on a bar 28 carried by an angle section support 29 which is mounted on a rod 30. Gravity maintains the blade in contact with the roll in the form of the invention shown here. Projections 31 on the top surface of the blade prevent lateral removal of the blade when it is pressed against the roll. The forward end 33 of the holder provides continuous support for the top surface of the blade.

The blade is free to slide lengthwise in the groove 24, means (not shown) being provided to hold the blade against endwise removal from the rod during normal operation. The operating pressure on the blade keeps the projections 31 on the blade in a position to prevent forward or backward lateral movement of the blade. When the

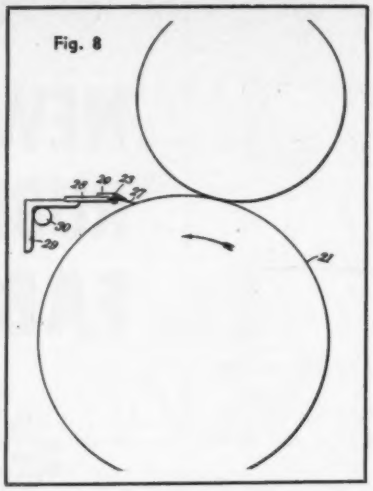

Fig. 8

blade has been lifted off the roll, it can be rotated to a position in which the projections can be levered out of the groove, thereby freeing the blade for lateral removal.

Advantages claimed for the doctor are as follows:

Patent Reviews . . .

(1) Should the blade-retaining groove 24 become choked with pulp, the blade can easily be removed laterally from the doctor without any longitudinal movement.

(2) Excess pressure cannot spring the blade out of its retaining groove.

(3) Various thicknesses of blades can be used by replacing the round blade-retaining rod by one with a suitable size of slot.

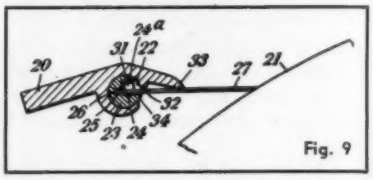

Fig. 9

(4) After the rear edge 26 of the blade wears away its support, it is only necessary to fit a new retaining rod, and not to replace the holder.

(5) The blade-retaining groove 24 is well shielded from contact with pulp and liquid.

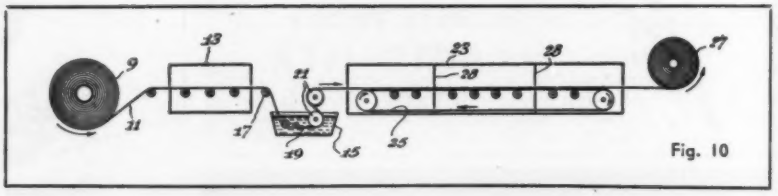

Fig. 10

Process for Impregnating Cellulosic Sheet

In the manufacture of various types of resin-impregnated, cellulosic sheet products, and especially sheet products impregnated with phenol-aldehyde resins, it is well known that the products which are manufactured by the use of resins which have been dissolved in organic solvents possess, for a given resin content, much better physical properties than do comparable products which are manufactured by the use of water soluble resins. This is particularly true in respect to the ability of the sheet to withstand bending stresses, i.e. the strain at failure characteristics of the material, and the impact resistance of the sheet, although other characteristics of the sheet, such as moisture resistance, flow ability and scuff resistance, may also be substantially improved by the use of resins dissolved in organic solvents. As a result, it has become generally accepted that resin-impregnated cellulosic sheet products which have been impregnated by the use of aqueous solutions of water-soluble, phenol-aldehyde resins are unsuitable for many applications. There are many advantages in the use of aqueous solutions of water-soluble resins for impregnating purposes, important among which are lower cost and the elimination of fire hazard.

In U.S. 2,665,221, issued Jan. 5, 1954 to Donald H. Grangaard and assigned to Paper Patents Co., this problem is solved.

One method of practicing the invention is shown in Fig. 10. A roll of the paper to be impregnated is shown at 9. A sheet of paper 11 is drawn through a heated oven 13, which reduces the moisture content of the sheet. The sheet is then guided through a dip pan 15, containing the impregnating resin. On leaving, the sheet passes between a pair of squeeze rolls 21, which are adjusted to control the resin content of the sheet. The sheet then passes through a drying oven 23, supported on a belt conveyor 25. The dried resin-impregnated sheet is then stored on a take-up roll 27.

The novel feature of the invention is the careful control of moisture in the resin and in the sheet. The limiting requirement has been found to be that the total amount of moisture available to wet the fibers of the sheet at the beginning of the resin drying operation should not exceed 8-10 per cent of the total weight of the wet, impregnated sheet before drying. This requires that the impregnation operation be carried out by the use of high solids content resins which are in an extended state.

In determining the amount of moisture which is present in the wet, impregnated sheet before drying, it is assumed that approximately one-half of the volatile content of the resin constitutes moisture available to wet the fiber, and the total amount of moisture available to wet the fiber is considered to be the sum of the moisture content in the sheet at the time it enters the resin-applying mechanism, plus one-half the volatile content of the liquid resin added to the sheet in that mechanism.

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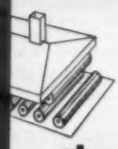

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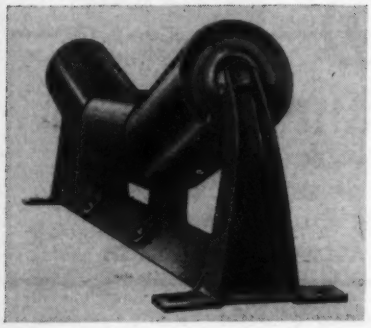


Belt idlers

Claimed to be a great advancement in the art of belt conveying, the latest MD and HD Series belt idlers with the new Duoflex seal, have been introduced.

The main feature of these belt idlers is the dual flexible contact seals which, from laboratory and field reports, perform the double function of keeping out dirt and retaining the grease for practically an endless period of time. These idlers are permanently lubricated. As an added feature, the entire design of the idler permits regreasing from either end when and if desirable through the shaft, the grease reservoir and the new Neoprene shaft connectors.

This new idler series also provides for easy roll removal without loosening or removing the stands. Rolls are held in place during shipment and operation by means of straps on center and end stands. Fine threading provides minute bearing adjustment. The locked-in type construction, through the grooved adjusting nuts, provides a rugged, truss-type construction to the assembly.

Extra heavy, electric-welded steel pipe of full and uniform thickness from end to end forms the belt carrying rolls, which are machine beveled on the ends to protect belt and workmen. Formed steel roll ends are pressed and welded into the pipe shells effecting maximum strength and true running rolls, according to the manufacturer. This series features the 2° tilted ends stands for engineered belt training. This tilt in the direction of belt travel tends to give the center roll of the troughing idler more control over the belt.

Additional features of this series are: self-cleaning inverted angle base, die straightened malleable iron stands, mounting feet cast integrally with the end stands, balanced and streamlined design, high-capacity tapered roller bearings, outer shields giving extra protection to double flexible seals, vented rolls for pressure balance, and plugs to prevent promiscuous greasing. *Jeffrey Manufacturing Co., Columbus, Ohio.*

Magnesium hand truck

Newest addition to the lightweight line of magnesium hand trucks is the Model No. 12-H-802. According to the manufacturer, it is rated to handle loads of up to 450 lb. safely and easily, yet weighs only 16 lb. when equipped with rubber-tired magnesium wheels, and 20 lb. when equipped with standard semi-pneumatic tires.

Fabricated completely of magnesium, this model is mechanically assembled from standard Magliner component parts, with no welding employed. In service, any part can be easily replaced from standard factory stocks, thereby eliminating maintenance expense and extending the useful service life of the truck.

The new truck incorporates a shovel-type nose unit 12 in. long and is specifically designed for facility in moving bulky packages and cartons, and loads of irregular shape or size. *Magline Inc., 1950 Mercer St., Pinconning, Mich.*

Recording controllers

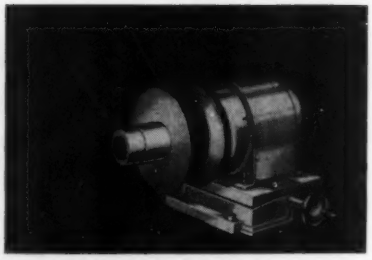
A new line of process instruments, including potentiometric and ac bridge recorders and recording controllers, has been announced. The instruments, designed for continuous measurement and control uninterrupted by periodic standardization, incorporate new measurement circuitry and components, according to company engineers. Foremost among the new features are a magnetic standard in the potentiometric system and a bridge-balancing unit in the ac bridge system.

Both models are available with either electric or pneumatic control and are equipped with a unique centerless pointer that simplifies chart changing and leaves practically all of the chart exposed to view for easy reading.

According to the manufacturer, the design of the new line will reduce maintenance and component replacement costs considerably. The new magnetic standard is said to eliminate dry cells, slidewires, and many moving parts found in conventional potentiometric instruments.

Heart of the ac bridge system, the new bridge-balancing unit supplies power to the bridge and provides a means for rebalancing it. In cases where the variable under measurement is temperature, the circuit is unbalanced by changes in the resistance bulb. Balancing is achieved by a servo motor which repositions the balancing unit's rotor.

Other advantages of the equipment include plug-in components, anti-backlash gearing, internal illumination, and an integral pen-inkwell assembly designed for automatic realignment. *General Electric Co., Schenectady 5, N. Y.*



Variable pulley

Re-engineered, rerated, and reappraised, a new variable pulley now on the market offers such advantages as 50 per cent reduction of overhung load, 40 per cent savings in space, and lower per horsepower cost, according to the manufacturer.

These pulleys are manufactured in a wide range of sizes from fractional to 15 hp ratings. Each size scales to all present and new NEMA motor frames. Speed ranges of 2¼ to 1, 3 to 1, and 4 to 1 are available. A large selection of stock variable pulley belts allows a wide choice of machine speeds and center distances. Companion bases and countershafts are also offered.

Flexibility of mounting to conform with almost any arrangement is another advantage claimed by the manufacturer. The pulleys may be mounted on either a horizontal or vertical motor shaft, driving to a flat or crown face pulley or to a sheave at the machine shaft. Power transmission is said to be smooth, quiet, clean and trouble-free. *Lewellen Manufacturing Co., Columbus, Ind.*

pH meter

A compact, panel-mounted automatic pH meter, which, the manufacturer claims, is able to be serviced in minutes by personnel right on the job, has been announced. It is said to represent the first industrial pH meter to accommodate virtually any combination of recorder and meter ranges. Its circuit allows the recorder pH scale to be shifted up or down, expanded or compressed. The entire pH range or as few as three pH units can be recorded full-scale on the recorder chart.

Circuits of the new meter are designed in three "plug-in" units, which can be instantly replaced by spares without disturbing panel connections. The circuit units are mounted on the inside of the meter door, with the housing itself permanently installed on a rack or panel. The door can be lifted entirely off its hinges, enabling complete disassembly of the instrument in less than 10 min. with just a screwdriver.

Another departure from previous meters is its use of the very latest electronic ad-

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vancements—miniature and subminiature tubes, printed circuits, etc. According to the manufacturer, these make possible accuracies within 0.02 pH in output to the recorder, as well as an instrument just one-quarter the usual size. *Beckman Instruments, Inc., South Pasadena, Calif.*

Variable speed disc assembly

New low speeds for the Flexi-Speed drive have been made possible by a new variable speed disc assembly. The new low speeds make the drive especially adaptable for driving at recommended speeds to practically any gear reducer, either worm or helical, it is claimed. This unit, because of its lower speeds, also is more adaptable to many more applications without reducer.

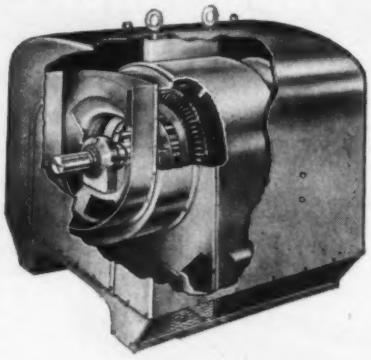
The latest model of the Flexi-Speed Drive may be mounted in almost any position around the driven equipment, may drive in any direction, and can deliver any desired speed within a ratio of 6:1, according to the manufacturer. The driven shaft may be located anywhere around the motor shaft, and the speed control handwheel may be located parallel to or in any of eight positions perpendicular to the motor shaft. Six different length belts offer a wide choice of shaft center distances. *Reeves Pulley Co., Columbus, Ind.*

Safety hook

A new safety hook, which is now on the market, is said to offer greater safety to both men and equipment during lifting operations, and is also simple and convenient enough so that hoist operators will make full use of its safety locking feature.

Once the hook is engaged, a stamped steel latch swings down and is securely held in place by a lock that is under spring tension. There can be no movement of the latch sideways because it fits snugly over the point, according to the manufacturer. Slight pressure on the release unlocks the latch, and spring tension on the release holds the latch open. The latch is designed to allow full and unobstructed use of the hook's large throat opening. It is also designed so that it will shed wires and other objects rather than snagging them.

The hook itself is made of drop-forged, heat-treated alloy steel and is claimed to have higher tensile strength than any other hook of its size on the market. Cadmium plating prevents any rusting or corrosion that might otherwise hinder its use. *Coffing Hoist Co., Danville, Ill.*



Weather-protected squirrel cage induction motors

Protection against moisture and corrosion is provided in a new line of weather-protected squirrel cage induction motors. Called "Sil-Clad", these motors feature complete silicone insulation on the motor winding, silicone enamel baked on all exposed metal parts of the motor, and stainless steel on parts subject to air abrasion. It is claimed that silicone has excellent heat resistance, repels water, is inert to corrosion from most air-borne chemical fumes, resists oxidation and sunlight, and is a very good electrical insulator.

The full silicone treatment of the motor is especially designed to provide protection in damp, moist, or steamy conditions, in sea coast locations subject to salt corrosion, in chemically active atmospheres or in other situations which induce deterioration by rusting, corrosion or moisture penetration.

The mechanical construction of the motor is such as to minimize entrance of airborne dirt and particles, according to the manufacturer. These motors are offered in ratings of 250 hp and larger. *Electric Machinery Mfg. Co., Minneapolis 13, Minn.*

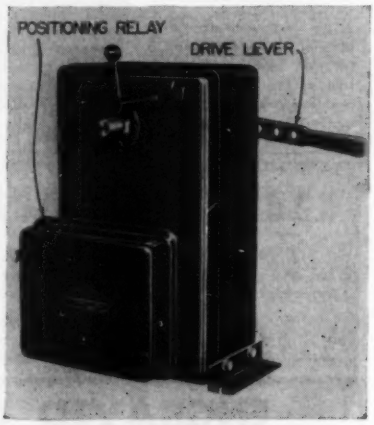
Adjustable die press

Production of open-end envelopes and hand-fold work can be more than doubled, it is claimed, through the use of the new "Adjustable Die" press.

Described as a revolutionary advance over any existing equipment, this machine features adjustable dies mounted in the head of the press. Since the dies do not have to be removed after every cut, the maker points out that many hours and much labor can be saved on every job. Time spent tinkering with adjusting rods is eliminated. Positive cutting accuracy is achieved and stock wastage prevented, as dies cannot shift out of position.

Fast changeovers from one job to another are said to be possible with this press because dies are adjusted quickly for a wide range of work. Length and width of envelopes is varied by cranking two screws located on the upper edge of the bed opening right in front of the operator. Easily-read calibrations speed settings. End and side flap dimensions are determined simply by adjusting rear and side stops. With this press it is claimed that short-run and odd-size jobs can be handled that might otherwise be unprofitable.

A safety feature of this press is dual control buttons. Both must be pressed simultaneously by both hands in order to actuate the head. *Hobbs Manufacturing Co., Worcester, Mass.*



Pneumatic control drive

Gas and liquid flow regulation may be improved by use of a new, small, pneumatically-operated control drive. Butterfly

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valves, dampers, feeders, etc., may now be operated on a straight-line flow characteristic.

A pneumatic signal actuates a positioning relay which in turn positions a piston-operated drive lever arm. Three different characteristic cams are supplied and may be shaped if necessary.

The drive is compact (10 x 11 x 19 in.) and may be installed in any position on a column, pipe or flat surface. Time required for full travel (75°) is adjustable. The drive has a four-inch piston stroke at a torque of 75 f.p. It operates on standard SAMA signal ranges 3-15 and 3-27 psig. Standard connecting linkage is available from stock. *Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, Ohio.*

Polyethylene paper coating

Low-molecular-weight A-C polyethylene is said to improve the gloss of bread wrappers. This material also promotes increased gloss retention at room temperatures, it is claimed. In addition, it is believed that this paper coating will enable bread wrappers to maintain this higher gloss under the elevated temperatures necessary for hot wrapping.

According to the manufacturer, actual production runs indicate that A-C polyethylene can be considered as a potential major ingredient in the blending of coatings for bread wrappers in combination with paraffin and microcrystalline waxes with which it can be readily blended. This polymer is also said to allow excellent heat seal. It is available in pellet form to facilitate handling in the plant. *Semet-Solvay Petrochemical Div., Allied Chemical & Dye Corp., 40 Rector St., New York 6, N.Y.*

Alkali-soluble vinyl acetate copolymer

"Elvadex" vinyl polymer, a new alkali-soluble vinyl acetate copolymer, is now available in commercial quantities. Previously sold on an experimental basis under the code name Elchem 1273, this vinyl acetate copolymer is used in paper coatings, among its many other uses. When applied to paper, it gives clear coatings that have high gloss, excellent greaseproofness, and high water resistance, according to the manufacturer. *E. I. duPont de Nemours & Co., Inc., Wilmington 98, Del.*

Control station

Vital operating indications and control for pneumatic control systems are now concentrated in a single control station. The "Mini-Line" control station provides a complete picture of control system performance and full flexibility of remote control.

An operator has the choice of remote manual control independeent of all automatic controllers for starting and stopping the process and for periods where the measuring and/or controlling elements may be out of service. Quick transfer from automatic to hand may be made without any disturbance to the process, according to the manufacturer.

Vertical gages indicate signals from the transmitter, set point or bias, hand control, and automatic control. The three control knobs are for automatic-hand selection, set point or bias adjustment, and hand control.

This unit operates on standard SAMA signal ranges of 3-15 or 3-27 psig. Control desk flush mounting uses an area only 6¼ x 4½ in. The manufacturer claims that accuracy is within ±½ per cent of signal range and air consumption is less than 0.2 cfm. *Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, Ohio.*

Hand tachometer

A new double range Model JX hand tachometer with stop button to hold readings until released has been introduced to the market. This hand tachometer is of the centrifugal mechanical type, with a range of 50 to 5,000 rpm and 25 to 2,500 fpm. According to the manufacturer, it is not as expensive as 3 or 5 range hand tachometers, yet covers a much longer range than a single range tachometer covers.

This new hand tachometer is of rugged design and has an 8 in. long 360° scale with 225 scale divisions. Speeds can be read to as close as 1 rpm on the low range (increments of 2 rpm). It operates in either direction of rotation, requires no oiling, and is unaffected by changes in temperature, stray electric currents or magnetic conditions, it is claimed. The tachometer comes with a full set of accessories in a carrying case. *Herman H. Sticht Co., Inc., 27 Park Place, New York 7, N. Y.*

Porosity meter

A new model Permeometer for measuring the porosity or permeability of materials too porous to be tested accurately or conveniently with a Densometer is now available.

This instrument is suitable for testing papers which give Densometer readings of less than 10 sec. per 100 cc. air flow. It measures air flow from less than one to about 400 cu. ft. of air per minute, per square foot, at a pressure drop equal to 0.5 in. of water.

According to the manufacturer, these porosity meters are widely used in testing filter and tissue papers, paper and cloth felts, blotting, saturating, absorbent and some bag papers, facial tissues and other products. It is claimed that routine tests can be made in less than 15 sec.

The Permeometer is portable and requires no special skills to operate. The motor operates on direct or alternating current from 25 to 60 cycles, 115 v. *W. & L. E. Gurley, Industrial Div., Troy, N. Y.*

Automatic pipe welding

The new high-speed automatic pipe welding process offers several advantages over the hand-welded type. Besides the savings due to faster production, the automatic process assures a much more uniform weld, with complete penetration.

In working stainless steel pipe, all welds are automatically wetted, immediately following the moving weld. This, it is claimed, reduces carbide precipitation to a minimum, resulting in a stronger weld, with an additional benefit of practically eliminating the usual distortion caused by the intense welding heat.

This method of welding also does away with the need for tacking prior to welding. The automatic welding is offered in O.D. and pipe sizes from 4 in. up, in stainless steel, monel, nickel, inconel, aluminum and titanium. *E. C. Wolferz Alloy Equipment, 20 Park St., Belleville 9, N. J.*

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Books

PAPER FOR PRINTING—TODAY AND TOMORROW. By the Intelligence Unit of *The Economist*, London. Presented jointly by Unesco and FAO. Published by the United Nations Educational, Scientific and Cultural Organization, 19 avenue Kleber, Paris-16e, France. Distributed by Columbia University Press, 2960 Broadway, New York 27, N. Y. 5¼ x 8½. 140 pages. $1.25. Paperbound.

"In 1949 'The Problem of Newsprint and other Printing Paper,' a study of the newsprint and printing-paper situation was published by Unesco, indicating both the size and nature of the problem at the time and probably future developments as world demand increased. But this earlier work did not go in any detail into the question of papermaking materials, nor did it attempt to indicate by what means the shortage of newsprint and printing paper could be eased. Besides bringing up to date the factual information presented in its predecessor, this new book also introduces a broader angle, describing and evaluating the action taken and envisaged to expand production of these essentials of education and culture."

The eight chapters of this book cover the following topics: Forest Resources and Uses of Wood; Wood Pulp and Pulpwood; Paper; Printing and Writing Paper; Newsprint; Newsprint Problems; New Sources of Papermaking Materials, and International Action.

VEGETATION AND WATERSHED MANAGEMENT. By E. A. Colman. Published by Ronald Press Co., 15 East 26th St., New York 10, N. Y. 6¼ x 9¼. 412 pages. $7.00.

This book is one of a series of research studies, developed under the sponsorship of The Conservation Foundation, that deal with complementary aspects of the national water-resource picture. It provides new background for those concerned with the management of cropland, of forest and range, and of water.

The author, who is Chief of the Division of Forest Influences Research, in charge of watershed management in wild land areas of California for the U. S. Forest Service, states that the purpose of this book is to review concepts and research in the relation of vegetation to water-yield control in order to ascertain the present level of our knowledge and to suggest fruitful courses of research for the future.

The book graphically points out how the management of vegetation plays a part in conserving water that is an indispensable supplement to the control of water in streams and ground-water basins. It describes the influence of vegetation on the hydrologic processes of interception, infiltration, soil-water drainage and storage, evapotranspiration, surface runoff, and erosion.

Dr. Colman analyzes all significant experimental work done in the United States and abroad that bears on vegetation management as it affects the control of water on the land. Research sections conclude with valuable summaries, showing what has been achieved and the further research needed before management can be widely applied.

Discussions are highlighted by a series of informative maps. These include a large five-color pull-out map, based on original research, which divides the United States into management regions for water-yield control, in terms of vegetation distribution and structure, climatic factors, and topography. The book offers a comprehensive bibliography of the extensive literature in the various fields reviewed. Many photographs are included.

LIVING CRAFTS. By G. Bernard Hughes. Published by Philosophical Library, Inc., 15 East 40th St., New York 16, N. Y. 5¼ x 8. 192 pages. $4.75.

In this book the reader is offered an opportunity to observe each of a score of crafts, not as a casual spectator but as the craftsman himself sees it—process by process. At the same time, the historical background of the craft is presented. Each craft in this book has been selected because its materials, tools, and techniques have proved their worth down through the centuries and, also, it still constitutes an integral part of present-day production.

One of the chapters of this volume deals with the paper-maker. Some of the other chapters cover the paper-marbler, parchment-maker, glass-blower, soap-boiler, silversmith, basket-maker, etc. Many photographs and line drawings are included.

Booklets and Pamphlets

THE EFFECT OF TEMPERATURE ON FELT PERFORMANCE (Vol. II, No. 4). Published by F. C. Huyck & Sons, Rensselaer, N. Y. 6 x 9¼. 8 pages. This bulletin presents data showing the importance of temperature to optimum felt operation and life. Three graphs are included.

A METHOD OF ESTIMATING TIMBER VOLUMES FROM AERIAL PHOTOGRAPHS. By Miles J. Ferree. Published by Department of Forest Extension, State University College of Forestry, Syracuse 10, N. Y. 8½ x 11. 50 pages. $1.00. "This report is intended to present methods developed recently by which more difficult breakdowns of timber volume-per-acre classifications can be made from aerial photographs. It is not meant to cover details of all aspects of a forest survey. Special emphasis is placed on the gross timber volume estimating phase."

RESEARCH NOTES, NOS. 51 TO 53. Published by Southeastern Forest Experiment Station, Federal Bldg., Asheville, N. C. 8 x 10½. These one and two-page papers cover the following topics: Labor Requirements as Influenced by Volume Cut Per Acre on the Bent Creek Experimental Forest; Spraying Logs of Oak Wilt Trees to Reduce Infection Hazard, and A Practical Schedule for Pruning Planted Slash Pine.

FOR WRAPPING UP PARCELS. Published by the Canadian Pulp & Paper Association, Sun Life Bldg., Montreal, P. Q., Canada. 8¼ x 10½. 26 pages. This booklet is about wrapping paper, particularly Canadian wrapping paper. It gives the following information: who manufactures wrapping paper in Canada, where it's made, and how it's made and used. Illustrated with photographs, charts, and drawings, the story is related in an easy-to-read style.

THE ANALYSIS OF HYDROGEN PEROXIDE SOLUTIONS (Bulletin No. 59). Published by Buffalo Electro-Chemical Co., Inc., Station B, Buffalo 7, N. Y. 8½ x 11. 6 pages. A critical summary of the most useful methods of assaying hydrogen peroxide solutions at all concentrations and under almost every conceivable condition is presented in this booklet, which also contains an extensive bibliography of original literature on the subject.

1954 PULPWOOD ANNUAL. Edited by American Pulpwood Association. Published by *Pulp & Paper* magazine, 370 Lexington Ave., New York 17, N. Y. 8¼ x 11¼. 64 pages. $1.00. The annual is divided into three parts: Part I presents the papers of the annual meeting of the American Pulpwood Association; Part II contains a review of Association activities, and Part III gives the Association's organization and program for 1954-55. It contains complete sections on Mechanization of the Pulpwood Industry, including accident cost reduction and the Canadian viewpoint on mechanization; Management of Company Forest Lands, including forest loans and pulpwood rotations; and Needs for Basic and Applied Research, including utilization problems of hardwoods and mill wastes. It also contains discussions on woods' training, safety and supervision; wood preparation; hauling and handling; industrial forestry; and improvement opportunities.

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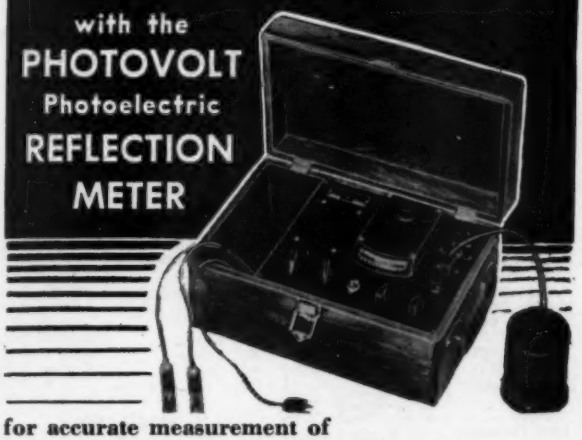

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MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

The following are quotations to mills, f.o.b. New York:

No. 1 White Shirt Cuttings	12.00 to 12.50
New Unbleached Muslins	14.50 to 15.00
Fancy Shirt Cuttings	7.25 to 7.50
No. 1 Percales	6.75 to 7.00
No. 1 Washables	3.00 to 3.25
No. 1 Light Silesias	7.00 to 7.25
No. 1 Light Prints	5.75 to 6.00
Light Flannelettes	7.25 to 7.50
Cottonades	3.75 to 4.00
Blue Overalls	6.00 to 6.50
Blue Cheviots	6.25 to 6.75
Canton Flannels, Bleached	11.00 to 11.25
Canton Flannels, Unbleached	11.00 to 11.25
Osnaburg Cuttings	8.50 to 9.00
Underwear Cuttings, Bleached	14.00 to 14.50
Underwear Cuttings, Unbleached	14.00 to 14.50
Khaki Cuttings—	
Sun Tan	6.75 to 7.00
Mixed	3.75 to 4.00
Linen Cuttings—	
American	7.25 to 7.50
White	13.00 to 14.00
Grey	13.00 to 14.00

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Roofing	
No. 1	1.10 to 1.20
No. 2	.80 to .90
No. 3 and 4	.60 to .70
Twos and Blues—	
Repacked	2.25 to 2.50
Thirds and Blues—	
Repacked	2.00 to 2.25
Miscellaneous	1.65 to 1.85
Whites, No. 1—	
Repacked	3.75 to 4.00
Miscellaneous	3.25 to 3.50
White, No. 2—	
Repacked	2.75 to 3.00
Miscellaneous	2.25 to 2.50

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shoppers	

ROPE and BAGGING

f.o.b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	4.25 to 4.50
Domestic	4.25 to 4.50
Wool Tares—	
Light	4.50 to 4.75
Heavy	4.75 to 5.00
No. 1 Scrap Bagging	3.75 to 4.00
Manila Rope—	
No. 1 large	6.00 to 6.50
No. 1 small	5.00 to 5.50
Sisal Rope—	
No. 1 large	5.50 to 5.75
No. 1 small	5.00 to 5.25
New Burlap Cuttings	5.75 to 6.25
Jute Threads—	
Foreign (Nom.)	6.00 to 6.25
Domestic	6.25 to 6.50
Strings—	
No. 1 sisal	5.00 to 5.25
No. 2 sisal	4.50 to 4.75
Soft jute	5.00 to 5.25
Mixed	2.75 to 3.00

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

	per ton
Shavings—	
Hard White Env. Cuts.	115.00 to 125.00
Hard White No. 1	90.00 to 95.00
Soft White, one-cut	75.00 to 80.00
Soft White, No. 1	55.00 to 60.00
Coated Soft	40.00 to 45.00
Fly Leaf No. 1	25.00 to 30.00
Fly Leaf, Woody No. 1	25.00 to 30.00
No. 2 Mixed Col. Woody	20.00 to 25.00
Flat Stock—	
No. 1 Heavy Books and Magazines, Repacked	22.00 to 24.00
Mixed Books	16.00 to 17.00
Ledger Stock—	
No. 1 White	55.00 to 60.00
No. 1 Mixed (Colored)	35.00 to 37.50
Manilas—	
New Env. Cuttings	65.00 to 70.00
New Cuts, One-Cut— Extra Manilas	17.00 to 18.00
Manila Tab Cards, Free of Ground Wood	70.00 to 75.00
Colored Tab Cards	45.00 to 50.00
Kraft—	
New Envelope Cuttings	62.50 to 67.50
Tripled Sorted No. 1 100%	40.00 to 45.00
No. 1 Old Assorted	27.50 to 32.50
News—	
White Blank	55.00 to 60.00
Overissue	22.00—
No. 1 Folded	14.00—
Old Corrugated Containers	20.00—
New Jute Corrugated Cuts	26.00—
Mill Wrappers	12.00—
Box Board Chips	9.00—
No. 1 Mixed Paper	8.00—

CHEMICALS

f.o.b. shipping point

Alum (Papermakers)—	
Lump, cwt.	5.05—
Ground, cwt.	4.30—
Powdered, cwt.	5.10—
Blanc Fixe—	
Pulp, bulk, ton	100.00—
Dry, barrels	105.00—
Bleaching Powder— Drums, cwt.	5.00 to 6.00
Casein (Domestic Standard) 20-30 mesh (bags), lb. 80-100 mesh (bags), lb.	27.00—
Argentine, lb.	23.50 to 24.00
China Clay—	
Domestic Filler Bulk (mine) ton	10.50 to 16.00
Domestic Coating Bulk (mine) ton	17.00 to 25.00
Imported (ship side) Bulk (lump) ton	20.00 to 30.00
Chlorine—	
Tank cars (wks) cwt.	2.23—
Gelatine (silicon), lb.	1.25 to 1.35
Glyc. (C.P.) drums, lb.	.30½ to .31
Litharge, powd. bbl. lb.	.15½ to .16

MARKET QUOTATIONS

	New York, per 100 lbs.	
Rosin (Gum)—		
E	8.45—	
F	8.45—	
G	8.45—	
WW	8.65—	
Rosin (Wood), carlots, F.O.B. South	4.75—	
Salt Cake—		
Dom. bulk (wks) ton.	21.50 to	22.00
Imp. bulks on dock—(Atl. ports) ton (Nom.)	22.00—	
Soda Ash—		
Bulk (works) cwt.	1.45—	
Paper bags, cwt.	1.75—	
Soda (Caustic)—		
Solid drums, cwt.	3.85 to	4.50
Ground and flake, drums, cwt.	4.25 to	5.00
Sodium Silicate—		
60 deg. 55 gal. drums, (works) cwt.	1.60 to	1.70
40 deg. 35 gal. drums, (works), cwt.	1.35 to	1.40
Starch—		
Pearl, 140 lb. bags, cwt.	6.39—	
Pearl, barrels, cwt.	6.39—	
Paper (Sp.) bags, cwt.	6.39—	
Powdered, barrels, cwt.	6.60—	
Sulphur (Crude) (Mine) bulk, long ton	26.50 to	28.00
Talc—		
Dom. 100 lb. bags (mine) ton	25.00 to	28.00
Canadian	35.00 to	45.00
Titanium Dioxide—		
Barium Pig, bbls., lb.	.22½ to	.23
Calcium Pig, bbls., lb.	.22½ to	.33
Zinc Sulphide, bbls., lb.	11.50 to	12.00

WOOD PULP

Quotations on domestic and Canadian wood pulp, dollars per short air dry ton, delivered consuming mills including basic freight allowances, follow:

Bleached Sulphite	140.00—
Bleached Sulphite, Canadian	140.00—
Unbleached Sulphite	120.00—
Unbleached Sulphite, Canadian	120.00—
Bleached Soda	140.00—
Bleached Soda, Canadian	140.00—
Kraft, Bleached	145.00—
Kraft, Bleach., Southern	142.50 to 150.00
Kraft, Bleach., Canadian	145.00 to 150.00
Kraft, Unbleached, Northern	132.50—
Kraft, Unbleached, Southern	95.00 to 105.00
Kraft, Unbleached, Canadian	100.00 to 125.00
Kraft, Semi-Bleached, Southern	140.00—
Sulphite Screenings	72.50—
Sulphate Screenings	67.50—
Groundwood	82.50 to 87.50

Quotations on imported wood pulp, dollars per short ton, on dock American Atlantic ports with varying freight allowances, follow:

Bleached Sulphite, Swedish	140.00—
Bleached Sulphite, Norwegian, freight allowed	140.00—
Bleached Sulphite, Finnish, freight allowed	140.00—
Unbleached Sulphite, Swedish	110.00 to 115.00
Unbleached Sulphite, Finnish, freight allowed	120.00 to 125.00
Kraft, Unbleached, Swedish, freight allowed	105.00 to 110.00
Kraft, Unbleached, Finnish, freight allowed	105.00 to 135.00
Kraft, Bleached, Swedish, on dock	142.50 to 145.00
Kraft, Bleached, Norwegian	

PAPER

Quotations are mill quotations New York City

Boards—

Prices per ton, delivered, 10 tons or more:

Plain Chip	75.00—
News vat lined chip	87.50—
Filled news	75.00—
Solid news	80.00—
White vat lined chip	125.00—
Chip tube and can stock	100.00—
Single manila lined chip	140.00—
Single jute lined chip	125.00—
Kraft liner	117.50 to 122.50

White patent coated:

.020	160.00—
.018	162.50—
.016	165.00—

Book Paper—

Machine coated, two sides

70 lb. No. 2 enamel, 25x 4 cases $17.25 38-500, trimmed 4 sides. Carloads	$16.80
45 lb. enamel, 25x38-500, 4 cases $13.05 trimmed 4 sides. Carloads	$12.10

Uncoated

55 lb. No. 2 offset, 25x38 4 cases	$14.80
500, trimmed 4 sides. Carloads	$13.85
50 lb. A Grade English Finish, 25x38-500, untrimmed 4 cases	$14.05
trimmed Carloads	$13.10
20 lb. envelope, 17x22-500, untrimmed Carloads	$12.40
16 lb. tablet, 17x22-500 Carloads	$11.35

Rag Content Bond—

Extra 100% rag	70.45—
100% rag	62.65—
75% rag	48.15—
50% rag	38.90—
25% rag	31.75—

Rag Content Ledger—

Extra 100% rag	72.65—
100% rag	63.90—
85% rag	52.50—
75% rag	49.40—
50% rag	40.20—
25% rag	33.00—

Sulphite Bond—

Air dry bond (Watermarked)	19.00—
No. 1 bond (M.F. watermarked)	15.00—
No. 2 bond (M.F. watermarked)	14.00—
Plain bond (M.F. unwatermarked)	14.00—

Sulphite Ledger—

No. 1, M.F. watermarked	20.50
No. 2, M.F. watermarked	19.50
Plain, M.F. unwatermarked	19.00

News—	per ton
Rolls, Standard (Contract)	125.00 to 126.00
Rolls (Spot)	(Nominal)
Sheets	138.00—

Tissues (Carlots)—	per reap
White No. 1	1.75—
White No. 2	1.35—
Bleached Anti-Tarnish	2.20—
Colored	2.00—
Anti-Tarnish Kraft	1.65—
Manila	2.00—
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.90—
Napkins, full crepe and embossed (12½ lb. to M shts.) per cs.	.90—
Toilet, Bleached (M shts.) per cs.	9.35—
Toilet, Unbleached (M shts.) per cs.	7.90—

Towels—	per case
Bleached	6.80—
Unbleached	5.90—

Wrappings (Kraft)—	per cwt.
Standard wrapping	8.00—
Butchers, counter rolls	8.50—
Standard bag, mill rolls	7.75—
Shipping sack, mill rolls	8.00—
Gumming, mill rolls	8.25—
Asphalting, mill rolls	8.00—
Envelope, mill rolls	9.50—

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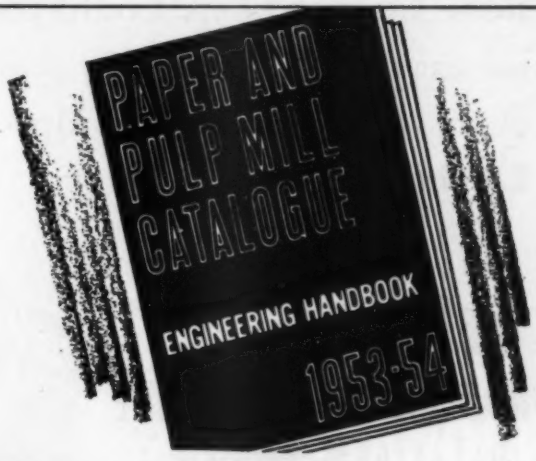

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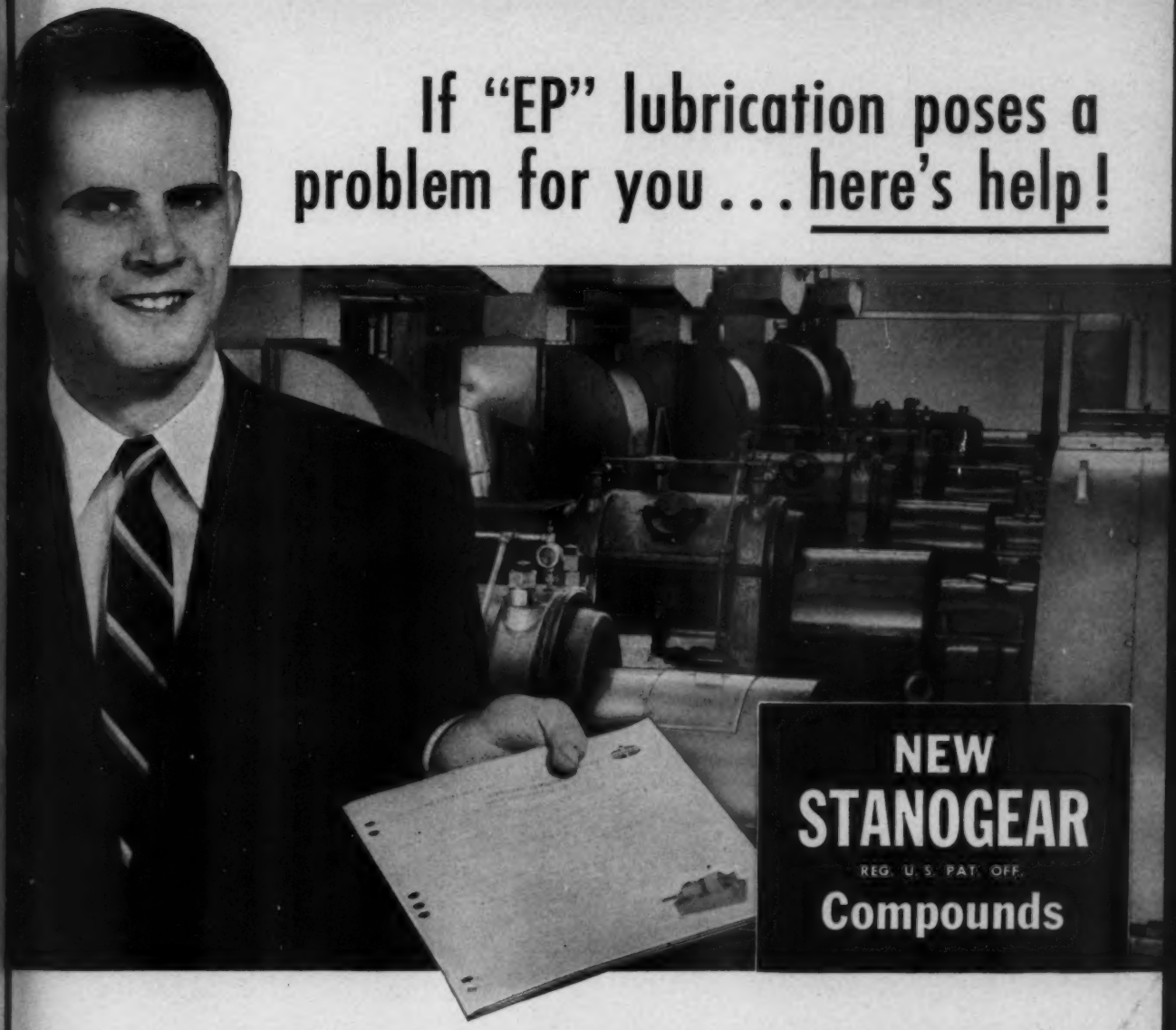

Here's new technical letter on Stanogear Compounds—send for free copy today!

If you've been having lubricating problems with overloaded or shock-loaded gears on your equipment, New STANOGEAR Compounds—with 7 better EP lubricating features—are made just for you. New and improved STANOGEAR Compounds are recommended for industrial gear applications where the operating conditions of the gear unit demand an extreme pressure lubricant . . . their superiority has been proved in test after test and *on the job!*

New STANOGEAR Compounds work seven ways better to solve your EP problems: **1.** higher load-carrying capacity **2.** superior retention of load-carrying capacity **3.** freedom from objectionable deposits **4.** excellent storage stability **5.** good water separation **6.** anti-foaming **7.** increased versatility

Now Standard Oil has prepared a special technical letter to give the complete story on STANOGEAR Compounds and EP lubrication. For your copy of this factual, informative bulletin, call your nearest Standard Oil office. The Standard Oil lubrication specialist there can answer your questions and send you a copy of the EP story, without obligation. Or write to: Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

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Corrosive Valve Services?

try this combination of economy and corrosion-resistance

LUNKENHEIMER "CAUSUL" METAL

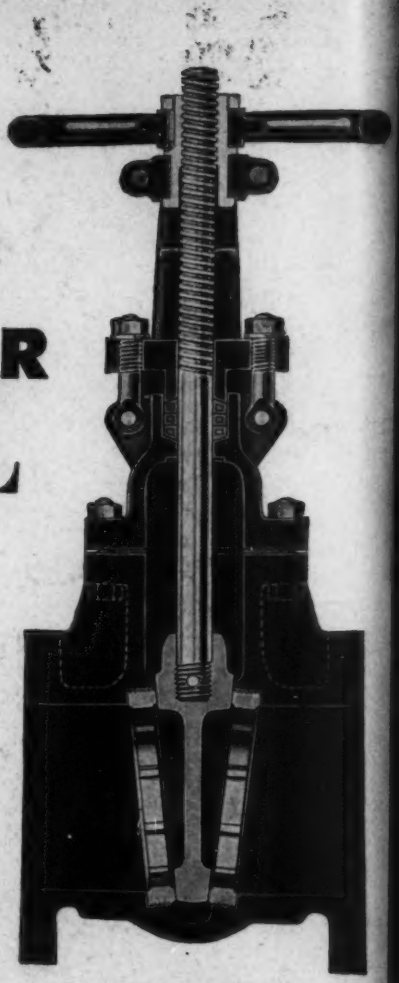

Fig. 1639-8—Gate Monel Trim
Fig. 1847-4—Gate 18-8 Mo Stainless Steel Trim
200 lb. W.O.G.
5 to 12 Inches

In corrosive valve applications, trim is a most important factor. If you can get *maximum* corrosion resistance in the trim, combined with *useful* corrosion resistance in a less expensive body, you can save money in most services.

That is exactly the combination you get in "Causul" Metal Valves. Trim is available in either Type 316 Stainless Steel or Monel Metal—providing the best corrosion resistance you can buy. "Causul" Metal bodies and bonnets are less expensive than all-Monel or all-Stainless and *have been used successfully for more than 20 years* in a wide variety of services. They are much more resistant to corrosion than iron valves . . . much tougher, too. And the problems of electrolytic corrosion between seating and body materials do not exist in "Causul" Metal Valves.

"Causul" Metal is an exclusive Lunkenheimer development. Ask your Lunkenheimer Distributor for more details, or write for Circular 592 to The Lunkenheimer Co., Box 360X, Cincinnati 14, Ohio.

Fig. 1708-8—Gate
Monel Trim
Fig. 1845-4—Gate
18-8 Mo Stainless
Steel Trim
225 lb. W.O.G.
Screwed
½ to 2 Inches

Fig. 1709-8—Gate
Monel Trim
Fig. 1846-4—Gate
18-8 Mo Stainless
Steel Trim
175 lb. W.O.G.
Flanged
1 to 4 Inches

3% NICKEL IRON GATE VALVES

Another outstanding Lunkenheimer Valve, for mildly corrosive service, features the same choice of trim as the "Causul" Metal Line, with a 3% nickel iron body. This combination has been developed for corrosive services in the petroleum, paper, wood-treating, and some chemical processing industries. It is available in the pattern shown above, and identified as Fig. 1578N-4, with Stainless trim, or Fig. 1578N-8, with Monel trim. Discs are made of "Causul" Metal. Write for more information.

LUNKENHEIMER®

THE ONE *Great* NAME IN VALVES

E-254-H